INSTRUCTION MANUAL

Motorola®

IN USE THE WORLD OVER
FM
FREQUENCY MODULATION

THE "RESEARCH" LINE of RADIO COMMUNICATIONS EQUIPMENT

BASE STATION

FM 2-WAY RADIO MODELS

152-174 MC. 30-60 WATT RF POWER

MP MASTER
MA35730

Motorola
Communications & Electronics Division
4545 W. AUGUSTA BLVD., CHICAGO 51, ILL.

Printed in U.S.A.

54P812230
Issue - C

List all service bulletins and addenda applicable to this manual.

SERVICE BULLETINS	ADDENDA

Motorola®

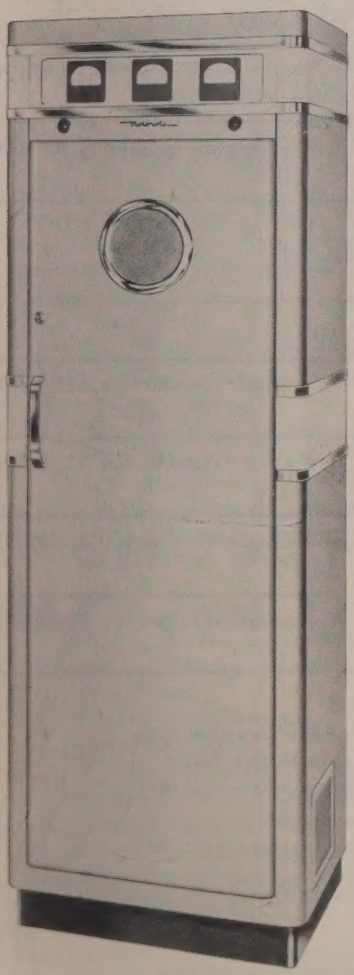
THE "RESEARCH" LINE

FM 2-WAY RADIO BASE STATION

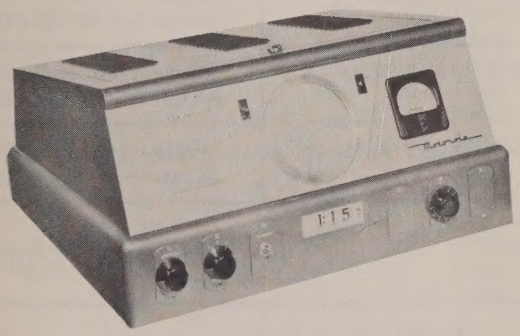
LOCALLY OR REMOTELY CONTROLLED

152-174 MC. 30-60 WATT RF POWER OUTPUT

117 VOLT, 60 CYCLE OPERATION



FLOOR MOUNTED MODELS
LOCAL AND/OR REMOTE CONTROL



DESK-TOP MODELS
LOCAL CONTROL - SINGLE RECEIVER

DESK-TOP MODELS
LOCAL CONTROL - TWO RECEIVERS

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4545 Augusta Blvd. Chicago 51, Illinois

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10/54-CP

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LOCALLY CONTROLLED MODELS

MODELS	DESCRIPTION
FSTRU-80BL(AW)1-A	Single-frequency 30 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-80BY(DW)1-A	Single-frequency 30 watt transmitter with pre-amplifier and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-80BY(EW)1-A	Single-frequency 30 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-140BL(AW)1-A	Single-frequency 60 watt transmitter with pre-amplifier and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-140BY(DW)1-A	Single-frequency 60 watt transmitter with pre-amplifier and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-140BY(EW)1-A	Single-frequency 60 watt transmitter and a single-frequency SENSICON receiver with PERMAKAY Filter.

REMOTELY CONTROLLED MODELS

MODELS	DESCRIPTION
FSTRU-80BR(CW)1-A	Single-frequency 30 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-140 BR(CW)1-A	Single-frequency 60 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-80BYR(BW)1-A	Single-frequency 30 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.
FSTRU-140BYR(BW)1-A	Single-frequency 60 watt transmitter and single-frequency SENSICON receiver with PERMAKAY Filter.

NOTE

In addition to the above models, specific variations of the base models are available. The (--X) is the only variation available in the "BL" models. The variations available and the corresponding nomenclature identities are as follows:

--C2(--) 2-freq. xmtr. and 1-freq. rcvr.
-C2R2(--) 2-freq. xmtr. and 2-freq. rcvr. (BY Models Only)
(-X) receiver less PERMAKAY filter
FSTRU-2- two 1-freq. receivers
(--)2-A Two 1-freq. rcvr. models with rcvr. frequency separations less than 500 kc. or with separations of 5 to 6 mc.

THE EQUIPMENT DESCRIBED IN THIS MANUAL IS MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING MOTOROLA U.S. PATENTS:

D-159,182 2,547,027 2,130,243 2,560,320 2,662,942 2,472,021 2,608,649 2,439,411 2,602,842 2,434,265 2,576,128
2,408,791 2,583,032 2,408,826 2,596,510 2,343,115 2,547,024 2,650,333 2,486,863 2,626,384 2,439,412 2,602,852
2,434,266 2,607,818 2,439,408 2,608,648 2,409,139 2,566,759 2,398,793 2,547,025 2,652,542 2,524,300 2,636,662
2,438,987 2,637,782 2,459,675 2,642,475 2,439,410 2,598,722 2,421,516 2,572,900 2,404,359 2,547,026 2,652,543
2,524,534 2,654,834 2,547,023 2,664,554

Other U.S. Patents Pending

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	TU152 Microphone	63B830696
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	P-7245 and P-7245-D Magnamike Microphone and Parts List	63A804341
	P-348-H Handset and Hang-up Box	63B810866
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	Single Receiver 80 and 140 "BYR" Models and Parts List	63E802368
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SECTION NUMBER

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MOTOROLA
PART NO. EPD #178
ISSUE - O 10/54-CP

Motorola

STANDARD EQUIPMENT COMPLEMENT

CROSS REFERENCE CHART

152-174 MC.
30 AND 60 WATT
BASE STATION MODELS

X:ITEMS INCLUDED IN STANDARD MODELS
2:TWO ITEMS REQUIRED

BASIC UNIT	DESCRIPTION	REFERENCE DIAGRAM
PA-8461-C	TRANSMITTER CHASSIS, SINGLE FREQUENCY, 30 WATT	63E80257
PA-8461-BP	TRANSMITTER CHASSIS WITH PRE-AMP, 1-FREQ., 30 WATT	63E80244
PA-8461-B	TRANSMITTER CHASSIS, SINGLE FREQUENCY, 30 WATT	63E80257
PA-8462-BP	TRANSMITTER CHASSIS WITH PRE-AMP., 2-FREQ., 30 WATT	63E80244
PA-8462-B	TRANSMITTER CHASSIS, TWO FREQUENCY, 30 WATT	63E80257
PA-8491-BP	TRANSMITTER CHASSIS WITH PRE-AMP., 1-FREQ., 60 WATT	63E80243
PA-8491-B	TRANSMITTER CHASSIS, SINGLE FREQUENCY, 60 WATT	63E80252
PA-8492-BP	TRANSMITTER CHASSIS WITH PRE-AMP., 2-FREQ., 60 WATT	63E80243
PA-8492-B	TRANSMITTER CHASSIS, 2-FREQUENCY, 60 WATT	63E80252
PA-8462-BC	TRANSMITTER CHASSIS, 2-FREQUENCY, 30 WATT	63E80257
PA-8462-CP	TRANSMITTER CHASSIS WITH PRE-AMP., 2-FREQ., 30 WATT	63E80244
PA-9267	SENSICON RECEIVER CHASSIS WITH LOCAL SQUELCH, 1-FREQ.	63E80284
PA-8433-A	SENSICON RECEIVER CHASSIS, SINGLE FREQUENCY	63E80284
P-8434	POWER SUPPLY CHASSIS, 30 WATT	63D84168
P-8464	POWER SUPPLY CHASSIS, 60 WATT	63D89020
P-8531-A	POWER SUPPLY CHASSIS, #2 RECEIVER	63B80339
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K-8494	METER PANEL KIT	63D89168
P-8449-B	METER SWITCHING PANEL	63C81227
P-8449-C	METER SWITCHING PANEL	63C81227
P-8659	SPARE FUSE AND AC PANEL, SINGLE RECEIVER	63E89162
K-8495	CABLE KIT	63E89162
K-8495-BL	CABLE KIT	63E82053
K-8498	CABLE KIT	63E89162
K-8675	CABINET CABLE KIT	63E89162
K-8688	CABINET CABLE KIT	63E89163
K-9171	CABINET CABLE KIT	63E80257
K-8339	ANTENNA MATCHING CABLE KIT	63E89162
K-8677	METERING KIT	63C81068
K-8677-A	METERING KIT	63C81068
K-8689-A	METERING KIT	63C81068
K-8689-C	METERING KIT	63C81068
K-8689	METERING KIT	63C81068
K-8689-B	METERING KIT	63C81068
K-9170	CABINET KIT	69B80227
K-8496-BL	CABINET KIT	69B80227
K-8670	CABINET KIT	69A80227
K-8680	CABINET KIT	69B80227
K-8496	CABINET KIT	69B80227
K-8660	CABINET KIT	69A80227
K-8678	TWO FREQUENCY TRANSMITTER KIT	63E89162
K-8676	ELECTRIC CLOCK KIT	63E89162
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D01	RECEIVER CONTROL CRYSTAL	
D03	TRANSMITTER CONTROL CRYSTAL	
A04	RECEIVER IF CRYSTAL	69C80134
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66A8914188	ALIGNMENT TOOL	69C80134
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P-7245-D	MAGNAMIKE MICROPHONE	63A80434
P-7245	MAGNAMIKE MICROPHONE	63A80434
D51	RECEIVER CONTROL CRYSTAL, #2 RECEIVER	
A12	RECEIVER IF CRYSTAL, #2 RECEIVER	
P-8659-C	SPARE FUSE AND AC PANEL	
K-8495-CL	CABLE KIT	63E82053
K-8675-C	CABLE KIT	63E89162
K-8670-A	CABINET KIT	
K-8680-A	CABINET KIT	
K-8495-C	CABLE KIT	63E89162

MODEL	PA-8461-C	PA-8461-BP	PA-8461-B	PA-8462-BP	PA-8462-B	PA-8491-BP	PA-8491-B	PA-8492-BP	PA-8492-B	PA-8462-BC	PA-8462-CP	PA-9267	PA-8433-A	P-8434	P-8464	P-8531-A	P-8066-N	P-8066-P	K-8494	P-8449-B	P-8449-C	P-8659	K-8495	K-8495-BL	K-8498	K-8675	K-8688	K-9171	K-8339	K-8677	K-8677-A	K-8689-A	K-8689-C	K-8689	K-8689-B	K-9170	K-8496-BL	K-8670	K-8680	K-8496	K-8660	K-8678	K-8676	K-8679	D01	D03	A04	66A8914187	66A8914188	66A8915168	P-7245-D	P-7245	D51	A12	P-8659-C	K-8495-CL	K-8675-C	K-8670-A	K-8680-A	K-8495-C
FSTRU-80BL(AW)1-A		X											X	X	X	X	X	X	X	X	X	X	X		X																																										
FSTRU-80BY(DW)1-A		X											X	X	X	X	X	X	X	X	X	X	X		X																																										
FSTRU-80BY(EW)1-A			X										X	X	X	X	X	X	X	X	X	X	X		X																																									
FSTRU-80BY-C2(EW)1-A			X										X	X	X	X	X	X	X	X	X	X	X		X																																									
FSTRU-2-80BY-C2(DW)1-A				X									X	X	X	X	X	X	X	X	X	X	X		X																																								
FSTRU-2-80BY-C2(EW)1-A				X									X	X	X	X	X	X	X	X	X	X	X		X																																								
FSTRU-80BR(CW)1-A					X								X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-80BR(CW)1-A					X								X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-80BYR(BW)1-A					X								X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-80BR(CW)2-A					X								X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-80BY-C2(DW)2-A					X								X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-140BL(AW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-140BY(DW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-140BY(EW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-140BY-C2(DW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-140BY-C2(EW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-140BY-C2(DW)1-A													2	2	2	2	2	2	2	2	2	2	2		2																																									
FSTRU-2-140BY-C2(EW)1-A													2	2	2	2	2	2	2	2	2	2	2		2																																									
FSTRU-140BR(CW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-140BR-C2(CW)1-A													2	2	2	2	2	2	2	2	2	2	2		2																																									
FSTRU-140BYR(BW)1-A													X	X	X	X	X	X	X	X	X	X	X		X																																							
FSTRU-2-140BR(CW)2-A													2	2	2	2	2	2	2	2	2	2	2		2																																									
FSTRU-2-140BR-C2(CW)2-A													2	2	2	2	2	2	2	2	2	2	2		2																																									
FSTRU-2-140BY-C2(DW)2-A													2	2	2	2	2	2	2	2	2	2	2		2																																									

Motorola®

THE "RESEARCH" LINE

FM 2-WAY RADIO BASE STATION

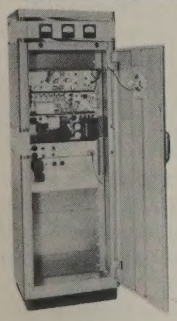
DESCRIPTION

1. DESCRIPTION

MOTOROLA "RESEARCH" Line of 152-174 mc. FM station radio equipment consists basically of the transmitter, receiver, and power supply chassis assembled in a metal cabinet. With associated accessories, these models provide dependable two-way communications with mobile and/or base stations. The receiver, transmitter and power supply chassis described herein are designed to operate from a 117 volt, 60 cycle primary power source.

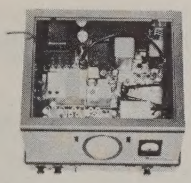
2. EQUIPMENT COMPLEMENT

a. Remotely Controlled Single-Receiver "BR" Models Consist of the Following Items:



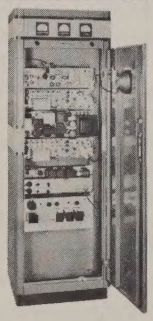
1 - Transmitter Chassis
1 - Receiver Chassis
1 - Power Supply Chassis
1 - Cabinet Including Speaker
1 - Meter Panel
1 - Remote Control Chassis
1 - Meter Switching Panel
1 - Spare Fuse & Outlet Panel
1 - Cable Kit

c. Locally Controlled Single-Receiver "BY" Models Consist of the Following Items:



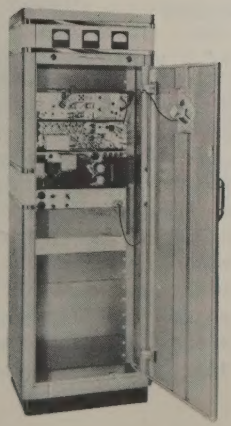
1 - Transmitter Chassis
1 - Receiver Chassis
1 - Power Supply Chassis
1 - Cabinet Kit
1 - Cable Kit
1 - Clock Kit
1 - AC Junction Strip
1 - Metering Kit
1 - Microphone
magnetic type - (DW) mod.

d. Remotely Controlled Two-Receiver "BR" Models Consist of the Following Items:



1 - Transmitter Chassis
2 - Receiver Chassis
2 - Power Supply Chassis
1 - Cabinet Including Speaker
1 - Meter Panel
1 - Remote Control Chassis
1 - Meter Switching Panel
1 - Spare Fuse & Outlet Panel
1 - Cable Kit

b. Locally Controlled Single-Receiver "BL" Models Consist of the Following Items:



1 - Transmitter Chassis
1 - Receiver Chassis
1 - Power Supply Chassis
1 - Cabinet Including Speaker
1 - Meter Panel
1 - Meter Switching Panel
1 - Spare Fuse & AC Panel
1 - Cable Kit
1 - Microphone, Magnetic Type

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4545 Augusta Blvd. Chicago 51, Illinois

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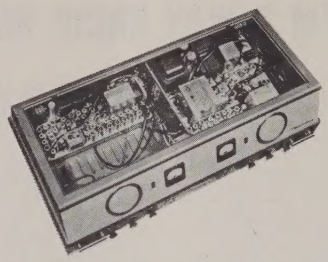
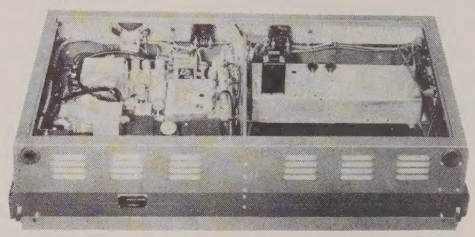
e. Locally Controlled Two-Receiver "BY" Models Consist of the Following Items:

1 - Transmitter Chassis
2 - Receiver Chassis
2 - Power Supply Chassis
1 - Cabinet Kit
1 - Cable Kit
1 - Clock Kit
1 - AC Junction Strip
1 - Metering Kit
1 - Microphone, Magnetic Type-(DW) Models



f. Remotely Controlled Single-Receiver "BYR" Models Consist of the Following Items:



1 - Transmitter Chassis
1 - Receiver Chassis
1 - Power Supply Chassis
1 - Cabinet Kit
1 - Cable Kit
1 - Clock Kit
1 - AC Junction Strip
1 - Metering Kit
1 - Remote Control Chassis

3. DESCRIPTION OF UNITS

a. Transmitter Chassis

The MOTOROLA "RESEARCH" Line 152-174 mc. transmitter chassis are available in one or two-frequency versions with 30 or 60 watts RF output. Three-frequency transmitters are available on special order and only in "BY" models in which the transmitter chassis does not incorporate the P-7247-A Microphone Pre-Amplifier Unit. The 30 watt transmitters are incorporated in the -80B Models and the 60 watt transmitters are incorporated in the -140B Models.

Refer to the applicable TRANSMITTER section of this instruction manual (30 or 60 watt) for specifications and service information relative to the various transmitters.

b. Receiver Chassis

The MOTOROLA "RESEARCH" Line 152-174 mc. SENSICON receiver chassis are available in one or two-frequency versions for adjacent channel operation. (Due to remote control limitations, the two-frequency receivers are not available in "BR" or "BYR" models).

Refer to the SENSICON RECEIVER section of this instruction manual for specifications and service information relative to SENSICON receivers.

c. Power Supply

The power supply chassis provides all the necessary voltages for operation of the 30 or 60 watt transmitter and one receiver from a 117 volt, 60 cycle AC primary power source. Complete fusing of the power supply circuits is provided. Two-receiver models incorporate a second power supply chassis which provides all the necessary voltages for operation of the second receiver.

Refer to the POWER SUPPLY section of this instruction manual for specifications and service information relative to the various power supplies available.

d. Cabinets

(1) "BR" Models

(a) Each remotely controlled single-receiver "BR" model is mounted in a K-8496 upright, steel cabinet. The cabinet is attractively designed and finished, suitable for exposed interior installation. Service accessiblity to front and back of the rack-mounted chassis is provided by sturdy, full length, key locked doors. Standard 19" vertical rack-type mounting facilities are provided for chassis installation. A 4-1/2" speaker is mounted in the door to provide local monitor facilities. The unit is finished in a two-tone glossy grey automotive type baked enamel and trimmed

in chrome. The cabinet dimensions are 22-1/2" wide x 15" deep x 68" high overall. A typical installation including all chassis weighs approximately 185 pounds complete. Safety interlock switches are provided on front and rear doors.

(b) Each remotely controlled two-receiver "BR" is mounted in a K-8660 upright steel cabinet. This cabinet is identical to the K-8496 Cabinet except for the number of spare panels. Because of the additional receiver and power supply, the available spare rack space is reduced.

(2) "BL" Models

The locally controlled "BL" model is mounted in a K-8496-BL upright steel cabinet. The K-8496-BL cabinet is the same as the K-8496 Cabinet except that the Front Door Interlock switch has been omitted. A panel cover, mounted in the position normally occupied by the remote control chassis employed in "BR" models has been added.

(3) "BY" Models

(a) Each locally controlled single-receiver "BY" model is mounted in a K-8670 or K-8670-A all steel table-top cabinet. Service accessibility to top and bottom of the individual chassis units is provided by virtue of the easy, tip-up feature. This feature eliminates the necessity of removing the units from the cabinet. Standard 19" horizontal rack type mounting facilities are provided for chassis installation. A 4-1/2" panel mounted speaker is provided. The unit is finished in a two-tone glossy grey automotive type baked enamel and trimmed in chrome. The cabinet dimensions are 21-7/16" wide x 21-5/32" deep x 10-5/8" high overall. A typical installation weighs approximately 90 pounds complete including chassis. A safety interlock switch is provided when bottom of equipment is exposed for servicing. The K-8670 Cabinet is for "-80BY" models and the K-8670-A Cabinet is for "-140BY" models.

(b) Locally controlled two - receiver "BY" models and remotely controlled single-receiver "BYR" models are mounted in cabinets similar to the K-8670 Series Cabinet used in single-receiver "BY" models except that they are 40-5/8" wide. "2-80BY" models are mounted in a K-8680 Cabinet, "2-140BY" models are mounted in a K-8680-A Cabinet and "BYR" models are mounted in a K-9170 Cabinet.

e. Cable Kits

The following cable kits include the large laced power control cables and the antenna interconnect cables for the entire cabinet.

Refer to applicable Intercabling Diagram in the INSTALLATION section of this manual.

(1) K-8495 and K-8495-C Cable Kits are the complete cable assemblies used in the single SENSICON receiver, -80 and -140 BR Models respectively.

(2) K-8498 Cable Kit is the cable assembly used in the two SENSICON receiver, -80 and -140 BR Models.

(3) The K-9171 Cable Kit is the complete cable assembly used in the -80 and -140BYR Models. This kit includes complete cabling facilities to accommodate both local and remote operation of "BYR" cabinet installations.

(4) K-8675 Cable Kit is the complete cable assembly used in the single-receiver -80 and -140BY Models. This kit includes the volume and squelch controls and the transmit switch necessary for local operation of "BY" cabinet installations.

(5) K-8688 Cable Kit is similar to the K-8675 except that it is used in two-receiver -80 and -140 BY Models. This kit includes the additional cables and controls required for #2 receiver chassis and its associated power supply chassis.

(6) The K-9339 Antenna Matching Cable Kit is used in two-receiver stations as 1/4 wave matching stubs for two receiver operation when an antenna coupler is not used.

(7) The K-8495-BL and K-8495-CL Cable Kits are the complete cable assemblies used in the single-receiver -80 and -140BL models respectively. These kits include the necessary cabling to interconnect units of "BL" cabinet installations for local operation only.

f. Meter Panel

The K-8494 Meter Panel consists of a metal mounting plate, a terminal board and three (3) meters: a 0-150 VAC line voltmeter, a 0-1000 VDC final amplifier plate voltmeter and a dual scale 0-50 microampere, 0-250 milliampere meter. The dual scale meter and associated rotary selector switches allow measurement of all transmitter and receiver circuits essential to tuning and checking as well as direct reading measurement of final RF amplifier plate current. The meter panel is installed at the top front of the "BR" and "BL" cabinet and is visable with the door closed.

Refer to the METERING FACILITIES section of this manual for complete details.

g. P-8449-B and P-8449-C Meter Switching Panel

The P-8449-B and P-8449-C Meter Switching Panels include a transmitter metering selector switch, a receiver metering selector switch, transmitter and receiver metering cable connectors, speaker ON-OFF switch and speaker receptacle. The panels are used on "BR" and "BL" Models.

Refer to the METERING FACILITIES section of this manual for complete details.

h. K-8677 and K-8677-A Metering Kits

Both the K-8677 and K-8677-A Metering Kits consist of a microammeter, a selector switch and an associated metering cable. The microammeter is calibrated 0-50 microamperes and is mounted on the right hand side of the control panel of the "BY" and "BYR" Models. The selector switch is mounted on the control panel and when used in conjunction with the metering cable selects the circuit to be metered. The K-8677 is used in metering 60 watt models of Base Station equipment while the K-8677-A is used with 30 watt models.

Refer to the METERING FACILITIES section of this manual for complete details.

i. K-8689 Series Metering Kits

The K-8689 Series Metering Kits are similar to the K-8677 Series Metering Kits differing basically with the addition of a longer cable to permit metering of two-receiver "BY" models and single-receiver "BYR" models.

Refer to the METERING FACILITIES section of this manual for complete details.

j. P-8659 and P-8659-C Spare Fuse and AC Outlet Panel

The P-8659 Spare Fuse and AC Outlet Panel is a metal plate installed in the one and two receiver -80BR and BL cabinet. It incorporates a dual AC convenience outlet and one set of spare fuses for the complete equipment. The P-8659-C is used with the one and two receiver -140BR Models. The AC line fuse block and fuses are also located on this plate.

Refer to the instructions and applicable intercabling diagram in the INSTALLATION & OPERATION section of this manual for complete details.

k. P-8679 AC Junction Strip

The P-8679 AC Junction Strip is used in the "BY" and "BYR" Models. It includes five AC utility outlets and a line switch. The switch controls three of the outlets and the other two outlets are "on" all the time. The transmitter-receiver power supply is plugged into one of the controlled outlets. The clock kit plugs into one of the uncontrolled outlets, so that the equipment may be turned "off" without turning "off" the clock. This strip is located on the inside of the cabinet on the left side and is accessible through the top access door opening.

Refer to the "BY" Intercabling Diagram in the INSTALLATION & OPERATION section of this manual for details.

l. K-8676 Clock Kit

The K-8676 Clock Kit includes a cyclometer type electric clock and is installed in the control panel of all "BY" and "BYR" Models. This clock is for 60 cycle operation only. Clocks for other frequencies are available on special order.

Refer to the "BY" Intercabling Diagram in the INSTALLATION & OPERATION section of this manual.

m. K-8678 Two-Frequency Switch

The K-8678 Two-Frequency switch is optional on all -80 and -140BY Models except -C2 and -C2R2 versions when it is included as a part of the cable kit. This switch is installed in place of one of the blank plates on the control panel. A 3-frequency rotary selector switch is available on special order.

Refer to the "BY" Intercabling Diagram in the INSTALLATION & OPERATION section of this manual.

n. Remote Control Chassis

The P-8066 series of remote control chassis is used in all "BR" and "BYR" central station models to provide those facilities necessary for complete remote control of the 2-way installation. This chassis contains the control line changeover relay(s), local receiver squelch control(s), and the modulator AF input level adjustment.

Refer to the REMOTE CONTROL CHASSIS section of this manual for specifications, servicing, and detailed description information.

o. K-9140 "C2R2" Jumper Conversion Kit

The K-9140 "C2R2" Operation Jumper Kit is incorporated in two-frequency transmitter and two-frequency receiver "BY" models to permit simultaneous switching of transmitter and receiver operating frequencies. This kit consists of two jumper wires which are connected from terminals 3 to 9 and 4 to 10 on the power supply terminal board.

Refer to applicable Intercabling Diagram for details.

p. Microphones

(1) "BY" Models with Preamplifier

The "BY" Models with preamplifier are supplied complete with the P-7245 "Magnamike" controlled reluctance microphone. The six prong connector plug connects directly into the six prong socket on the P-7247-A Preamplifier on the transmitter chassis.

Also available at extra cost is the TU152 Uni-dyne dynamic Microphone. The TU152 terminates its 7 ft. cable in a six prong plug to connect directly into the P-7247-A Preamplifier.

(2) "BL" Models with Preamplifier

The "BL" Models are supplied complete with the P-7245-D "Magnamike" controlled reluctance microphone. The six prong connector plug connects directly into the six prong socket on the P-7247-A Preamplifier on the transmitter chassis.

(3) "BY" Models without Preamplifiers

The "BY" Models without the preamplifier do not have a microphone supplied as part of the model. Refer to paragraph (5) following for the various microphones which are available for use with this type equipment. Note, however, that these microphones must be ordered separately if desired.

(4) "BR" or "BYR" Models without Preamplifier

A microphone may be employed with standard "BR" or "BYR" models for local, extended local, or test purposes. Note, however, that no microphone is included as part of these models. Refer to paragraph (5) following for the various microphones which can be ordered separately for use with this type equipment.

(5) Optional Microphones

(a) The P-348-H Handset and Hang-Up Box is available for use with "BY", "BYR" or "BR" models not incorporating a preamplifier. This unit is supplied with a 5 ft. spade lug terminated cable designed for connection to the power supply terminal board of the respective model base station employed. Refer to instructions 54P810943 included with the Handset and Hang-Up Box for complete connection and service information concerning this unit.

(b) The TU128 Desk Set is available for use with "BY", "BYR" or "BR" models not incorporating a preamplifier. This desk set is supplied with an 8 ft. spade lug terminated cable designed for connection to the power supply terminal board of the respective Base Station Model employed. Refer to instructions 54P891722-C included with the Desk Set for complete connection and service information concerning these units.

(c) The TU127 Desk Set is available for use with "BR" Models. This desk set is supplied with a 25 ft. spade lug terminated cable designed for connection to the remote control chassis terminal board. The TU127 Desk Set is used primarily for extended local control applications. Refer to instructions 68P830620 included with the Desk Set for complete connection and service information concerning this unit.

NOMINAL PERFORMANCE SPECIFICATIONS

MODEL	"BR" and "BL" Upright Cabinet Models	"BY" Desk-Top Console Models "BYR" Desk-Top Console Models
FREQUENCY	152-174 mc	
NOMINAL RF POWER OUTPUT	30 watts, 152-167 mc. 25 watts, 167-174 mc. or 60 watts, 152-167 mc. 50 watts, 167-174 mc.	
MODULATION DEVIATION ACCEPTANCE	Less than -6 db. at ±15 kc.	
20 DB. QUIETING SENSITIVITY	With PERMAKAY Filter: Less than 0.6 microvolts With Tuneable Filter: Less than 0.65 microvolts All models have 50-72 ohms RF input impedance.	
RECEIVER SELECTIVITY	With PERMAKAY Filter: More than -100 db. at ±30 kc. With Tuneable Filter: More than -100 db. at ±120 kc. More than -50 db. at ±60 kc.	
METERING	Three panel mounted meters with associated selector switches to measure: (1) All transmitter and receiver circuits essential to tuning or servicing. (2) Final amplifier DC plate voltage. (3) AC line voltage.	A single scale panel mounted meter with associated rotary selector switches and chassis mounted metering sockets are provided to measure all circuits essential to tuning and checking.
POWER SOURCE	117 VAC, 60 cycle, single-phase	
NOMINAL POWER INPUT (ONE-RECEIVER	Standby: 115 w. Standby: 115 w. Trans.: 295 w. Trans.: 490 w.	Standby: 115 w. Standby: 115 w. Trans.: 295 w. Trans.: 480 w.
NOMINAL POWER INPUT (TWO-RECEIVER)	Standby: 155 w. Standby: 155 w. Trans.: 325 w. Trans.: 520 w.	Standby: 155 w. Standby: 155 w. Trans.: 325 w. Trans.: 520 w.
DIMENSIONS (ONE-RECEIVER)	68-3/8" high x 22-1/2" wide x 16-7/8" deep, overall	10-5/8" high x 21-1/2" wide x 21-7/8" deep, overall
DIMENSIONS (TWO-RECEIVER)	68-3/8" high x 22-1/2" wide x 16-7/8" deep, overall	10-5/8" high x 40-5/8" wide x 21-7/8" deep, overall
F.C.C. LICENSE DESIGNATION	PA-8461 - 1 freq., 30 watt PA-8462 - 2 freq., 30 watt PA-8463 - 3 freq., 30 watt PA-8491 - 1 freq., 60 watt PA-8492 - 2 freq., 60 watt	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Motorola®

THE "RESEARCH" LINE

FM 2-WAY RADIO BASE STATION

INSTALLATION AND OPERATION

IMPORTANT

Before proceeding please note that although any good electrician can make the installation, it is illegal for anyone to place the transmitter on the air, tune or make adjustments except under direct supervision of a qualified radio operator holding a Radio Telephone License of applicable class. (See section 13.630 of the F.C.C. Rules and Regulations). F.C.C. regulations state that when a transmitter is initially installed, a suitable procedure shall be employed to ascertain that the carrier is on the assigned frequency. It is recommended that this frequency check be made before the equipment is placed in service. A MOTOROLA F4MU-24B Series Frequency Monitor or equivalent frequency measuring device should be used for this purpose.

NOTE

The efficiency of the equipment depends upon a good installation.

1. INSPECTION

Inspect the equipment thoroughly as soon as possible after delivery. If any part of the equipment has been damaged in transit, report the extent of damage to the transportation company immediately.

2. ASSEMBLY OF "BY" MODEL

The base plate of the cabinet has been removed to permit the unit to be screw-mounted on a wooden base. This is done to prevent damage to the unit due to shifting in the packing box. The cabinet is removed from the wooden base by taking out the four machine screws on each side.

Two free-swinging "guide and support rods" (one on each side of the cabinet) attach the cabinet to the base plate and enable the cabinet to stand in a vertical position when access to the bottom of the chassis is desired. These "guide rods" are attached to the cabinet on the center of the cabinet rails at the lower edge of the cabinet.

Remove the top cover of the cabinet. The key to the lock is packaged in a small envelope and attached to the cardboard filler between the base plate and the cabinet. Place the cabinet on base plate in a vertical position such that (1) the bottom of the chassis faces the same direction as the front of the base plate and (2) the two studs on the rear of the cabinet fit in their respective guide slots on the base plate. Pull the cabinet forward (in the vertical position) to the front end of the guide slots.

A small hole will be found in the two right angle brackets located in the two front corners of the base plate. Release from the cabinet the two guide rods which are fastened up along the bottom of the cabinet channel. The grooved stud on the unattached end of each guide rod should be placed in the small hole and secured with the hairpin-clips. The hairpin-clips are packaged in a small envelope next to the key envelope.

By grasping the front end of the cabinet and slowly pulling it forward, the cabinet may be seated horizontally in its normal operating position on the base plate.

3. LOCATION

Select the location of the station unit with the following factors taken into consideration.

a. <u>"BR" Models</u>

(1) The AC line, the ground lead, and all control lines enter through the bottom of the cabinet.

(2) The antenna transmission line should enter either through the hole in the top or on the right side of the "BR" cabinet.

(3) The "BR" cabinet should be placed to permit at least 19-5/8" clearance at the back and 18-3/8" clearance at the front to allow opening the back and front access doors.

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b. "BL" Models

(1) The AC line, the ground lead, microphone cable and antenna lead-in enter the cabinet through the bottom of the cabinet.

(2) The antenna transmission line should enter either through the hole in the top or on the right side of the cabinet.

(3) The cabinet should be placed to allow sufficient clearance in the front and back of the cabinet to open the doors for inspection and servicing.

c. "BY" and "BYR" Models

(1) The AC line, ground lead, microphone cable, and antenna lead-in enter the cabinet through the openings at the rear of the cabinet.

(2) At least 22-1/2" must be allowed from the base of the cabinet to permit the upper section of the cabinet to be opened for access to the bottom of the chassis.

4. EXTERNAL CONNECTIONS

All units have been assembled at the factory as complete as possible to simplify installation.

a. Antenna and Transmission Line

(1) Installation

The antenna and the transmission line should be installed prior to the installation of the base station equipment. The antenna and its associated items must be ordered separately as they are not included with MOTOROLA base station models. The antenna and the transmission line should be installed according to the instructions which are supplied with the individual items.

After the antenna, transmission line and base station have been installed connect the transmission line connector to the ANT. coaxial receptacle of the antenna changeover relay.

(2) Antennas

Two MOTOROLA antenna models are available for use with base stations operating in the 152-174 mc. range. For antennas to be used between 162 and 174 mc. the exact operating frequency must be specified with the order. The following antenna models are available.

(a) Model P-8350 Coaxial Skirt Antenna. This antenna includes one K-8269 Mounting Clamp Kit and one 42T823572 Wraplock Kit. The K-8269 Clamp Kit is for mounting the antenna on a 2 to 2-1/2" (O.D.) pipe stub. The Wraplock Kit includes metal strapping and hardware for securing 100 feet of transmission line.

(b) Model P-8351 Isoplane Antenna. No mounting clamps, hardware or transmission line strapping is supplied with this antenna.

(3) Transmission Line Kits

MOTOROLA transmission line kits include the transmission line and all connectors and fittings required to make a complete installation between the antenna termination and the ANT. receptacle of the antenna changeover relay. The length of line required must be specified with the order. Kits are available as follows:

(a) For Model P-8350 Coaxial Skirt Antenna. The kits include a K-8551 Adapter Kit with a pressure gauge, an 8-foot RG-8/U jumper with PL-259 connectors at both ends and the specified length of 7/8" air dielectric line with fittings attached. Air line is shipped under pressure.

1. DS-9613 Transmission Line Kit. For use with indoor or outdoor upright cabinet base stations.

2. DS-9613-A Transmission Line Kit. For desk top cabinet installations.

(b) For Model P-8351-A Isoplane Antenna. The kits include the specified length of transmission line, RG-8/U, RG-17/U or 7/8" air line as described below. The maximum recommended length for RG-8/U or RG-17/U is 100 feet.

1. TK173 Transmission Line Kit. The transmission line included is RG-8/U. A PL-259 connector is installed at each end. This kit is for both upright and desk top cabinets.

2. DS-9611 Transmission Line Kit and DS-9611-A Transmission Line Kit. Includes RG-17/U transmission line with required jumper assemblies. DS-9611 is for upright cabinets, DS-9611-A is for desk top cabinets.

3. DS-9612 and DS-9612-A Transmission Line Kits. 7/8" air line with gauge and jumpers. DS-9612 is for upright cabinets, DS-9612-A is for desk top installations.

b. Ground Connection

Connect a good external ground to terminal #5 in the bottom row of terminals of the right hand side on the rear of the remote control chassis and to the "BR" and "BYR" Cabinet Rack . For "BL" and "BY" models, connect an external ground to the chassis mounting bracket.

Refer to specific intercabling diagram for details.

c. Control Line ("BR" and Remotely Controlled "BYR" Models)

(1) Two Wire Control Line

Connect the two wire 500 ohm control line from the remote control console to terminals 7 & 8 located in the bottom row of terminals on the remote control chassis as viewed from the rear of the cabinet. In the case of the two-receiver remote control chassis, terminals 7 & 8 in the bottom row of the right hand terminal board as viewed from the rear of the cabinet are the control line terminals. Polarity of the control line must be observed. The control line must be connected so that terminal 8 is positive with respect to terminal 7 when the push-to-talk circuit is energized from the console. This control line should be shielded, the shield extending from where the line parallels the power and ground leads to within a short distance of the line input terminals. The shielding should be bonded and grounded to the transmitter frame (Terminal 5 bottom row of the remote control chassis right hand terminal board).

(2) Four Wire Control Line

When using a 4-wire control system, connect the AF control line to terminals 7 & 8 on the bottom row of the terminal board on the remote control chassis. In the case of a two-receiver remote control chassis use the terminals on the right hand terminal board as viewed from the rear of the chassis. Connect the DC control line to terminals 1 & 2 in the bottom row of the remote control chassis terminal board. Polarity of the DC control line must be observed. The connections must be such that terminal 2 is positive with respect to terminal 1 when the push-to-talk circuit is energized from the console. The AF line should be shielded when running close to ground leads. The line shield should be run close to the terminals for the line, bonded and grounded to the transmitter frame. (Terminal 5 bottom row of the remote control chassis right hand terminal board.)

Refer to the JUMPER TABLE on the applicable remote control chassis schematic diagram in the REMOTE CONTROL section of this manual for necessary 4-WIRE REMOTE CONTROL jumper connections.

d. Power Connection

NOTE

It is recommended that all other connections to the equipment be completed before connecting the power line to the equipment.

Connect a 117 VAC single phase power line to the entrance fuse block located at the rear of the "BR" and "BL" cabinet on the K-8659 Spare Fuse and Outlet Panel. "BY" and "BYR" models include an AC line cord which is routed through one of the openings in the rear of the cabinet to an AC Outlet.

To avoid turning off the equipment inadvertently, an on-off switch is purposely omitted from "BR" models. Therefore, do not connect the power source until the equipment is to be placed in operation unless a wall switch has been installed between the power source and the equipment. It is recommended that an automatic circuit breaker be installed between the power source and the equipment.

e. Microphone Connection

ON "BL" models, connect the P-7245-D "Magnamike" microphone directly to the pre-amplifier which is mounted on the transmitter chassis. A transmitter incorporating the microphone pre-amplifier can not be modulated by a microphone connected to the power supply MIC. receptacle or terminal board.

For "BY" models without pre-amplifier, connect microphones with 4 pin microphone plugs on their cables to the microphone receptacle on the power supply chassis. If a P-348-H microphone or TU128 Desk Set is used, connect the microphone cable to the terminal board on the power supply chassis as shown on Intercabling Diagram 63E891621 or 63E891630.

On "BY" models with pre-amplifier, connect the microphone with the six prong cable plug, P-7245 "Magnamike" or TU152 Dynamic Microphone, directly to the pre-amplifier which is mounted on the transmitter chassis. A transmitter incorporating the microphone pre-amplifier can not be modulated by a microphone connected to the power supply MIC receptacle or terminal board.

5. PRE-OPERATIONAL CHECKS

Check all cable lugs and connections, fuses, and all bolted connections. Be sure all tubes are firmly in their sockets and the tube connectors secure.

Connect the AC power cable to the entrance fuse block or close the line switch if one has been installed. The green indicator light will become illuminated to indicate 117 volts is "on". For "BY" and "BYR" models, an ON-OFF switch is provided on the AC junction strip on the left inside of the cabinet.

The equipment has been accurately tuned and adjusted at the factory for peak performance and maximum tube life. However, the circuits should be checked before actual operation, as the equipment may have been subjected to severe mishandling or dropping while in transit. Before being put in service the transmitter chassis should be checked for proper meter readings as outlined in the applicable TRANSMITTER section of this manual. The receiver should be checked for proper sensitivity and gain measurements by checking the meter readings as outlined in the stage measurements chart (1st six entries) of the RECEIVER section of this manual. If any stages are found to need retuning it is recommended that the equipment be completely realigned.

When testing a "BR" or "BYR" model at the transmitter location, a test microphone may be connected to the MIC receptacle on the power supply chassis.

a. Metering of Single-Receiver "BR" Models

(1) Be sure that all metering cables are connected per Intercabling Diagram 63E891622.

(2) A rotary switch designated "TRANSMITTER" functions as the metering switch to select the various circuits of the transmitter chassis.

(3) A rotary switch designated "RECEIVER" functions as the metering switch to select the various circuits of the receiver chassis.

(4) The toggle switch adjacent to the SPEAKER terminals on the metering panel is the cabinet speaker on-off switch. "Up" position the speaker is "on", "down" position the speaker is "off".

b. Metering of Two-Receiver "BR" Models

The metering procedure is the same as outlined for single receiver "BR" models except refer to 63E891629 Intercabling Diagram and connect the metering cable to the receiver to be metered.

c. Metering of "BL" Models

The metering procedure is the same as outlined for single receiver "BR" model except refer to Intercabling Diagram 63E820535.

d. Metering of Single Receiver "BY" and "BYR" Models

(1) The metering kit installed in the "BY" and "BYR" cabinet is composed of the necessary cabling, a panel mounted 0-50 microampere meter and the associated rotary selector switch.

(2) Be sure that all the metering cables are connected per specific intercabling diagram.

(3) The rotary switch on the control panel functions as the metering selector switch for both transmitter and receiver, selecting the circuits of the transmitter receiver chassis. "T" on the knob indicates transmitter and "R" indicates receiver.

e. Metering of Two-Receiver "BY" Models

The metering kit installed in the two-receiver "BY" cabinet is composed of the necessary cabling, a panel mounted 0-50 microampere meter and the associated rotary selector switch.

The metering procedure is the same as outlined for single receiver "BY" models except refer to intercabling diagram 63E891630 and:

(1) Connect the metering cable to the receiver to be metered.

(2) The cabinet speaker is connected to both receivers at all times.

6. PRE-OPERATIONAL SYSTEM ADJUSTMENTS

Connect the antenna to be used to the station unit. Load the transmitter with the antenna connected, follow the procedure outlined in the TRANSMITTER section of this manual.

a. Single-Receiver "BR", "BL", and "BY" Model Receiver Volume & Squelch Adjustments

(1) Squelch Adjustments

Place the SPEAKER switch on the meter switching panel in the "up" (SPEAKER ON) position for "BR" and "BL" models. The speaker is

always "on" in "BY" models. Turn the volume control on the receiver chassis fully clockwise. With no signal being received, turn SQUELCH control (on front panel for "BY" models; on remote control chassis for "BR" and "BYR" models; on receiver chassis for "BL" models) from the full counterclockwise position (open squelch), slowly in the clockwise direction until the speaker is just quiet (noise squelched). Do not advance the control beyond the point of just squelching the noise to avoid decreasing receiver sensitivity.

(2) Volume Adjustments

For all "BR" and "BYR" models, connect a db. meter or AC voltmeter across terminals 7 & 8 in the bottom row of the right bottom terminal board on the rear of the remote control chassis. Adjust the VOLUME control on the receiver to obtain zero db. or a reading of 1.73 volts or the AC voltmeter with a signal being received.

For "BL" models adjust the VOLUME control on the receiver chassis for the desired speaker level with a signal being received.

For "BY" models adjust the VOLUME control on the front panel to its mid-position. Adjust the VOLUME control on the receiver chassis for the desired speaker level with a signal being received.

b. Two-Receiver "BR" and "BY" Models Receiver Volume and Squelch Adjustments

(1) Squelch Adjustments

Make the adjustment for #1 receiver, as outlined for the single receiver model, with the VOLUME control of the #2 receiver in the maximum counterclockwise (off) position. Similarily, adjust the #2 receiver squelch with the #1 receiver VOLUME control in the maximum counterclockwise (off) position.

(2) Volume Adjustments

Make the adjustment for the #1 receiver as outlined for the single-receiver models with the VOLUME control of the #2 receiver turned completely counterclockwise (off).

Mark the setting of the VOLUME control of the adjusted receiver and return it to full counterclockwise (off) position. Similarly adjust the VOLUME control of the #2 receiver.

Reset the VOLUME control of the #1 receiver to the predetermined position.

c. Control Line Level Adjustment for "BR" and Remotely Controlled "BYR" Models

Refer to REMOTE CONTROL CHASSIS section of this manual for setting the LINE INPUT control.

7. OPERATING PROCEDURE

a. Locally Controlled "BL" Models

(1) To Transmit:

Assuming all adjustments have been made per the pre-operational instructions, press the push-to-talk button on the microphone and proceed with transmission.

(2) To Receive:

Assuming the VOLUME and SQUELCH controls have been adjusted per the pre-operational instructions, the receiver is in full operating condition whenever the push-to-talk circuits of the transmitter are not actuated.

b. Locally Controlled "BY" Models

(1) The AC power to the station installation is turned "on" by placing the junction strip toggle switch in the ON position. This switch is located on the left, inside top of the cabinet and is reached through the top access door. (The primary power switch is located under cover to eliminate inadvertent switch actuation.)

(2) To Transmit:

Press the push-to-talk button on the microphone or the TRANSMIT switch on the cabinet panel. The red panel mounted jewel will glow indicating that the transmitter control circuits have been energized.

Speak directly into the microphone at a normal voice level. The MOTOROLA transmitters CANNOT be overmodulated due to the efficient limiting action of the I.D.C. "INSTANTANEOUS DEVIATION CONTROL" which is incorporated in all units. Release the microphone button or transmit key upon completion of transmission.

(3) To Receive:

Assuming the VOLUME and SQUELCH controls have been adjusted per the pre-operational instructions, the receiver is in full operating

condition whenever the push-to-talk circuits of the transmitters are not actuated.

NOTE

If multi-channel transmitter and / or receiver is used, place frequency selector switch in desired frequency position.

(4) Handset Operation (2-Receiver Models)

A HANDSET RCVR 1 - RCVR 2 selector switch is provided on the front panel of all two-receiver "BY" Base Station models. The setting of this control determines which receiver is to be heard in the handset when this accessory is used. When the switch is in the RCVR 1 position and the handset is removed from its holder, the No. 1 cabinet speaker is muted and the receiver No. 1 output is fed to the handset. In the RCVR 2 position with the handset removed from its holder, the No. 2 cabinet speaker is muted and the receiver No. 2 output is fed to the handset. With the handset in its holder, the outputs of both receivers are fed to their respective speakers regardless of the setting of the HANDSET switch.

When a handset is not employed with this equipment, a jumper MUST be connected across terminals 25 and 26 of the Transmitter-Receiver Power Supply. So wired, the outputs of both receivers are always fed to their respective speakers regardless of the setting of the HANDSET RCVR. 1 - RCVR. 2 switch.

(5) The AC power to the station installation is turned "off" by means of the junction strip toggle switch.

c. Remotely Controlled "BR" and "BYR" Models

(1) Local Test Control

A P-255 series microphone may be connected to the MIC. receptacle on the transmitter power supply chassis to turn "on" and modulate the transmitter. If the unit is a two-frequency transmitter, local operation will only be possible on Channel #1. Local multi-channel selection is available on special order only.

(2) Remote Control

Remote control of all "BR" models is accomplished from the associated Remote Control Console unit over a 2-wire or 4-wire control line. Complete operating instructions are included in the Remote Control Console Instruction Manual.

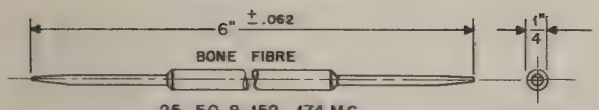
(3) Local or Extended Local Control

Local or extended local control is possible using a P-348-H Handset and Hang-Up Box or a Desk Set. Refer to the instructions included with the respective units for connections and operation details.

Combined extended local and remote operation is possible with limitations. Neither operator (local or remote) can hear the other modulate the carrier. The remote operator has no visual indication when the local operator is "on the air". Operating levels depend upon line lengths. For these reasons combined operation is not recommended without first consulting the MOTOROLA Systems Engineering Dept.

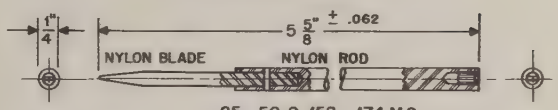
MOTOROLA
RESEARCH LINE EQUIPMENT
ALIGNMENT TOOLS

PART NO. 66A891568



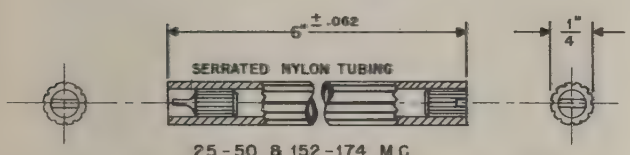
25-50 & 152-174 MC
SENSICON & DISPATCHER RECEIVER
TOP TUNING ONLY
(REPLACED BY 66A835721)

PART NO. 66A835721
(ALSO PART NO. 66A800824)



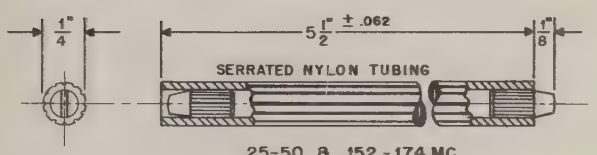
25-50 & 152-174 MC
SENSICON, DISPATCHER, UNI-CHANNEL & AM RECEIVER
TOP & BOTTOM TUNING
(PART NO. 66A835721 MAY ONLY BE USED IN PLACE OF THE 66A8000824 FOR ALL APPLICATIONS)

PART NO. 66A891488



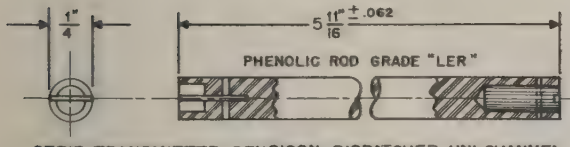
25-50 & 152-174 MC
STRIP TRANSMITTER, SENSICON, DISPATCHER, UNI-CHANNEL AND AM RECEIVER
RECEIVER BOTTOM TUNING ONLY
(REPLACED BY 66A835721)

PART NO. 66A891487



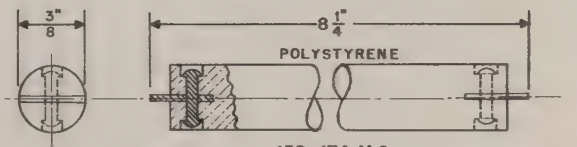
25-50 & 152-174 MC
STRIP TRANSMITTER

PART NO. 66A474489



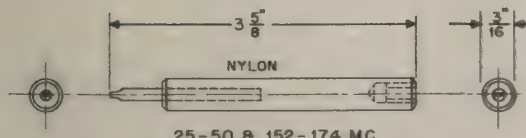
STRIP TRANSMITTER, SENSICON, DISPATCHER, UNI-CHANNEL AND AM RECEIVER
RECEIVER BOTTOM TUNING ONLY

PART NO. 66A84645



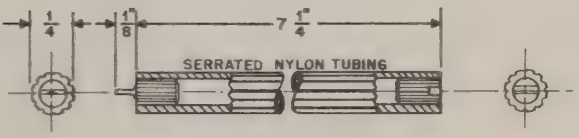
152-174 MC
1/4 KW
P-8310-B FINAL AMPLIFIER

PART NO. 66A891846



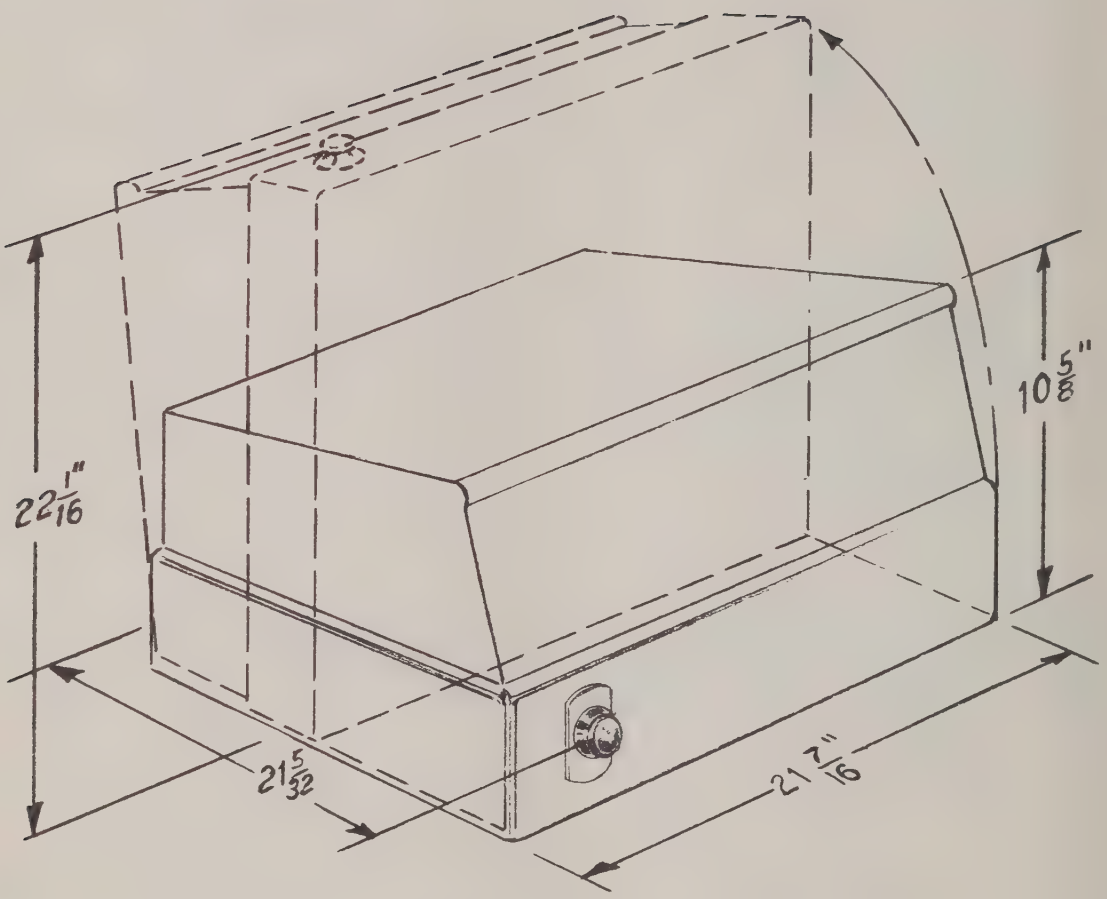
25-50 & 152-174 MC
"HANDIE-TALKIE" UNIT AND FM RADIOPHONE PACK
ALL STAGES

PART NO. 66A810479

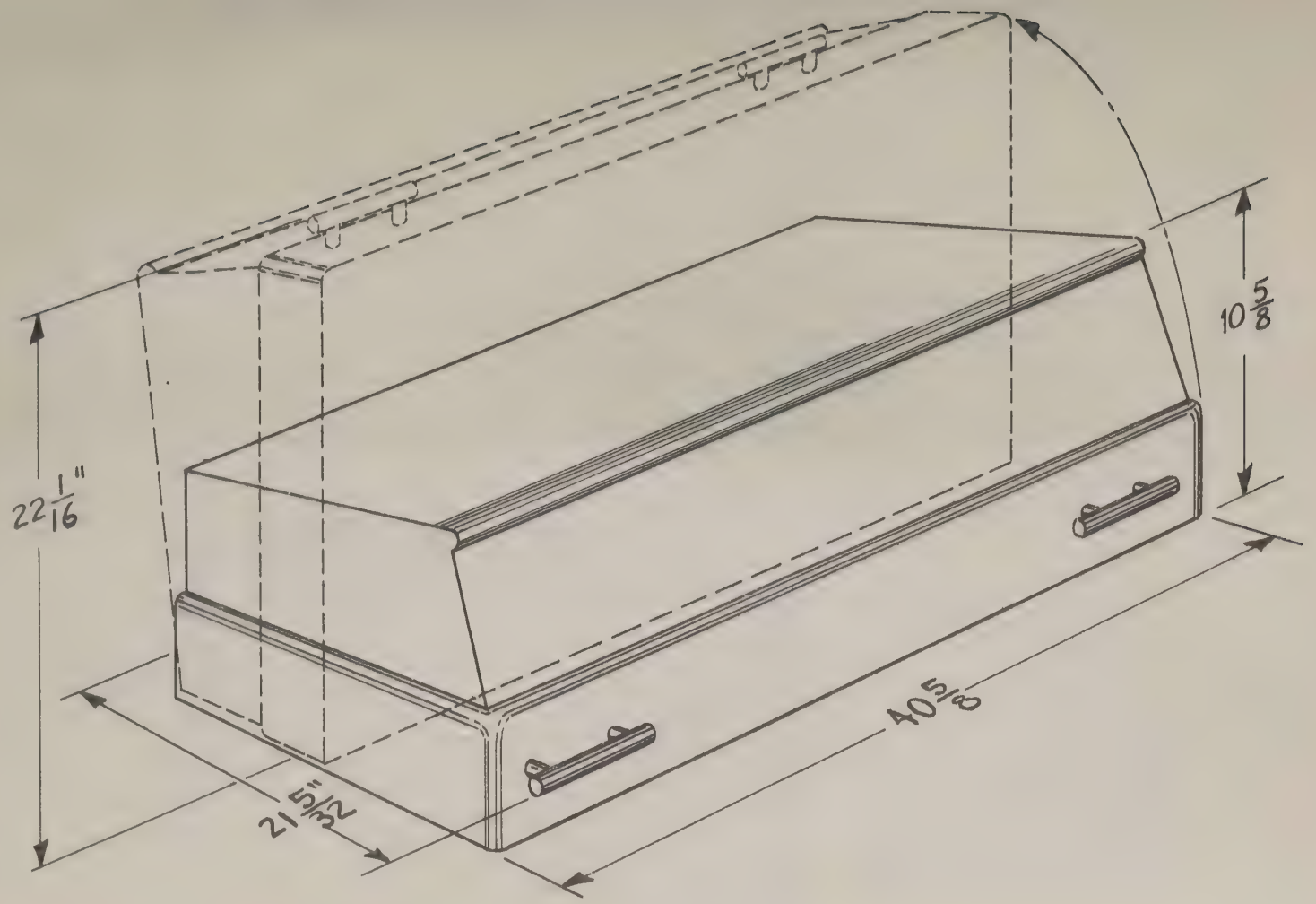


UNI-CHANNEL FREQUENCY MONITORS

K-8670 CABINET
DIMENSIONAL DETAIL



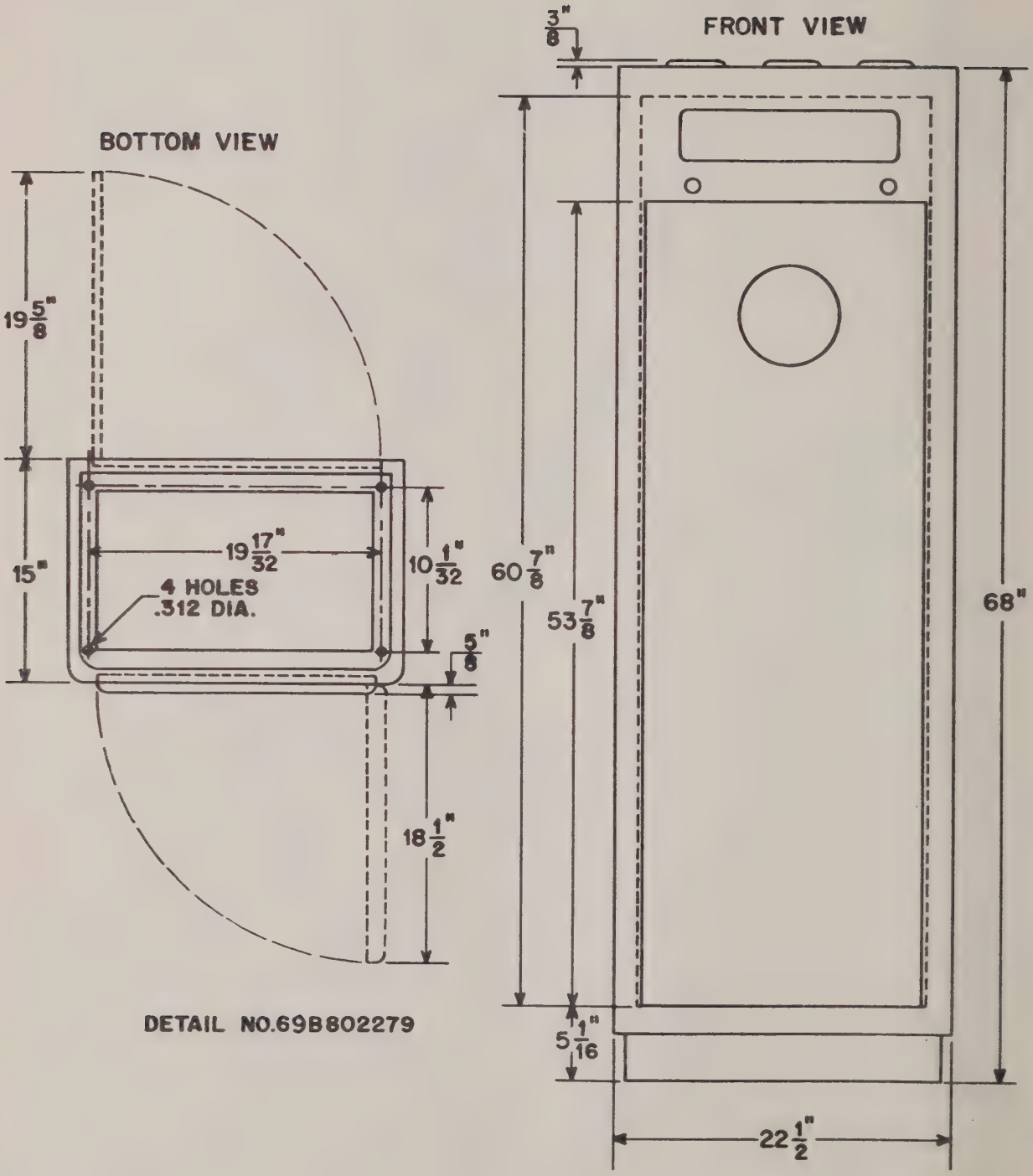
MOTOROLA
PART NO. 69A802278
ISSUE - O 10/54-CP



MOTOROLA
PART NO. 69B802277
ISSUE - O 10/54-CP

K-8680 CABINET
DIMENSIONAL DETAIL

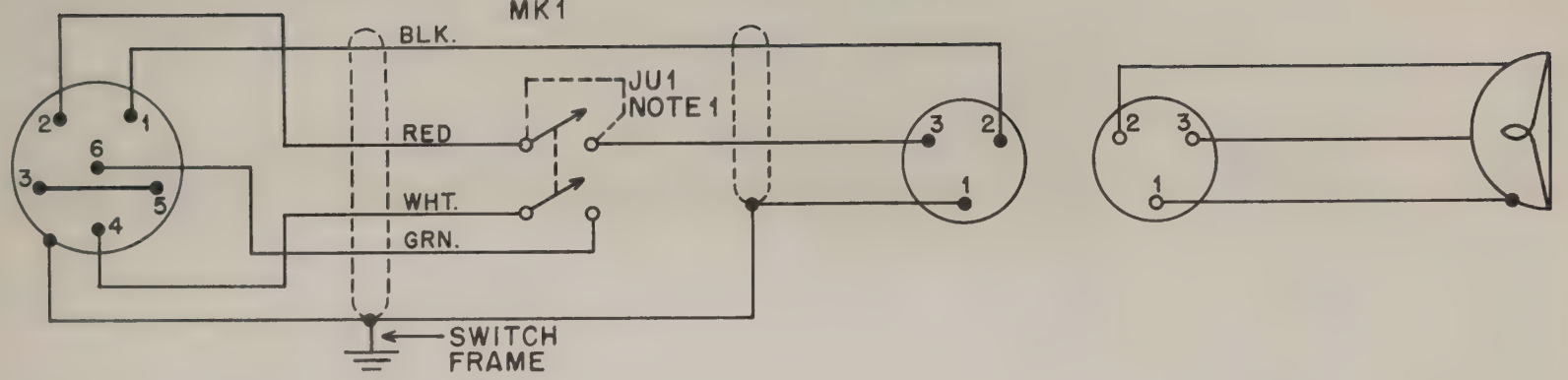
UPRIGHT CABINET
DIMENSIONAL DETAIL



DETAIL NO.69B802279

MOTOROLA
PART NO. 69B802279
ISSUE - A 10/54-CP

MODEL TU152
MK1



NOTE:
1. REMOVE JUMPER JU1 FOR PARALLEL OPERATION OF MICROPHONES.

MOTOROLA
PART NO. 63B830696
ISSUE - O 10/54-CP

TU152 "UNIDYNE" DYNAMIC MICROPHONE
SCHEMATIC DIAGRAM

MOTOROLA
PART NO. 63C830623
ISSUE - B 10/54-CP

MODEL TU128 DESK SET SCHEMATIC DIAGRAM

THIS DIAGRAM IS APPLICABLE *AS DRAWN* TO THE LATEST PRODUCTION VERSION INDICATED BY SUFFIX NUMBERS IN THE TABLE. IT IS APPLICABLE TO EACH EARLIER PRODUCTION VERSION WHEN AMENDED BY *ALL* SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS.

	MODIFYING SERVICE BULLETIN NUMBERS 490	626
	DISCONTINUED VERSIONS	LATEST VERSION
TU128	*	-1

* NO SUFFIX CHANGE

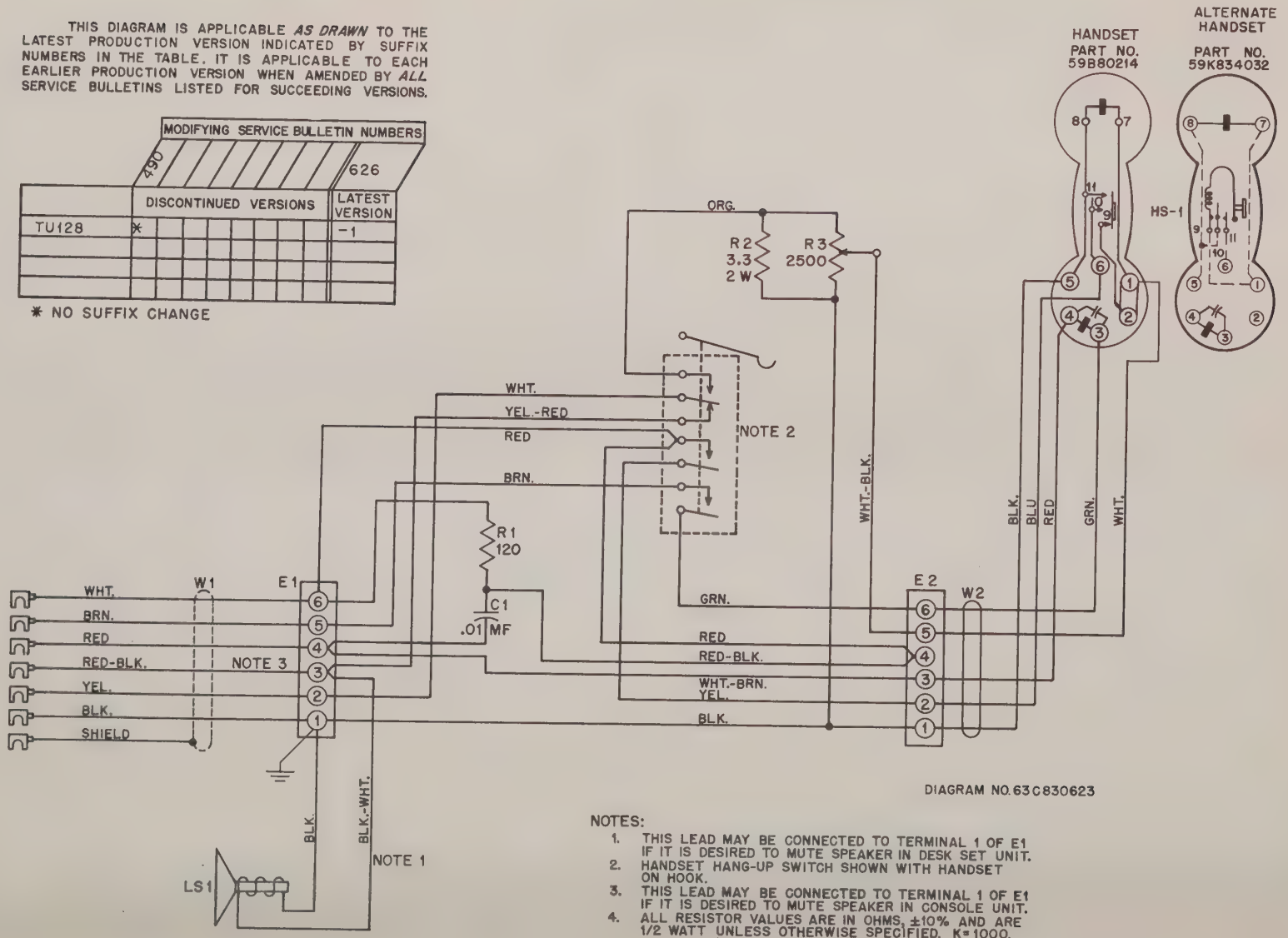


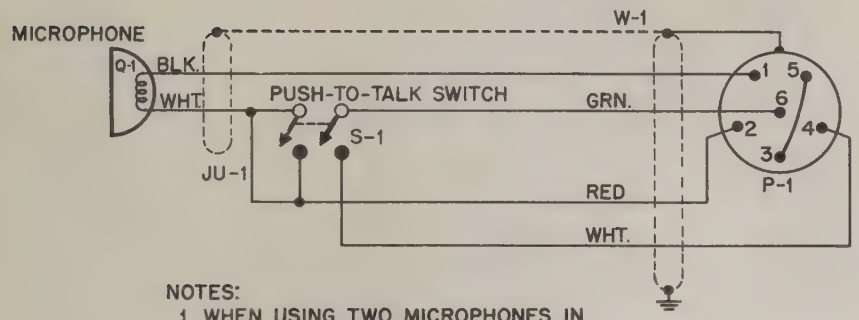
DIAGRAM NO. 63C830623

NOTES:

1. THIS LEAD MAY BE CONNECTED TO TERMINAL 1 OF E1 IF IT IS DESIRED TO MUTE SPEAKER IN DESK SET UNIT.
2. HANDSET HANG-UP SWITCH SHOWN WITH HANDSET ON HOOK.
3. THIS LEAD MAY BE CONNECTED TO TERMINAL 1 OF E1 IF IT IS DESIRED TO MUTE SPEAKER IN CONSOLE UNIT.
4. ALL RESISTOR VALUES ARE IN OHMS, ±10% AND ARE 1/2 WATT UNLESS OTHERWISE SPECIFIED. K=1000.

P-7245 AND P-7245-D "MAGNAMIKE" MICROPHONE SCHEMATIC DIAGRAM

MODEL	DESCRIPTION
P-7245	DESK STAND WITH 7' CABLE
P-7245-D	DESK STAND WITH 30' CABLE



NOTES:
1. WHEN USING TWO MICROPHONES IN PARALLEL, REMOVE JUMPER JU-1.
2. JUMPER ALLOWS "FOOT-SWITCH" AND "INTER-COM" SWITCH OPERATION.

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Schematic Diagram
63A804341

1. P-7245, P-7245-D Magnamike Microphone

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
MI 1	50D893699	MICROPHONE, Magnetic: desk type; includes: 59K810174 MICROPHONE ELEMENT: impedance; 3900 ohm at 1000 cps.; reference part Q 1 40K810173 SWITCH, push: D.P.D.T.; reference part S 1 1V803807 CORD, desk stand: reference part W 1; includes: 30A800972 CORD, microphone: 4 conductor; shielded; each conductor #20 stranded; 7 ft. long required 28A881072 CONNECTOR, plug: male; 6 contact; polarized; round; black phenolic insulator; reference part P 1 (Used only on P-7245)
	or 50K820049	Magnetic: desk type; includes: 59K810174 MICROPHONE ELEMENT: impedance; 3900 ohm at 1000 cps.; reference part Q 1 40K810173 SWITCH, push: D.P.D.T.; reference part S 1 1V820050 CORD, desk stand; reference part W 1; includes: 30A800972 CORD, microphone: 4 conductor; shielded; each conductor #20 stranded; 30 ft. long required 28A881072 CONNECTOR, plug: male; 6 contact; polarized; round; phenolic insulator; reference part P 1 (Used only on P-7245-D)
P 1	28A881072	CONNECTOR, Plug: male; 6 contact; polarized; round; black phenolic insulator; p/o W 1
Q 1	59K810174	MICROPHONE ELEMENT, Impedance; 3900 ohms at 1000 cps. p/o MI 1
S 1	40K810174	SWITCH, Push: D.P.D.T.; p/o MI 1
W 1	1V803807	CORD, Desk stand; includes: 30A800972 CORD, microphone: 4 conductor; shielded; each conductor #20 ga. stranded; 7 ft. long required; p/o MI 1 28A881072 CONNECTOR, plug: male; 6 contact; polarized; round; black phenolic insulator; reference part P 1; p/o MI 1 (Used only on P-7245)
	or 1V820050	Desk stand; includes: 30A800972 CORD, microphone: 4 conductor; shielded; each conductor #20 ga. standed; 30 ft.long required; p/o MI 1 28A881072 CONNECTOR, plug: male; 6 contact; polarized; round; black phenolic insulator; reference part P 1; p/o MI 1 (Used only on P-7245-D)

MOTOROLA
PART NO. 63A804341
ISSUE - C 10/54-CP

MOTOROLA
PART NO. 63B810866
ISSUE - B 10/54-CP

P-348-H HANDSET & HANG-UP BOX SCHEMATIC DIAGRAM

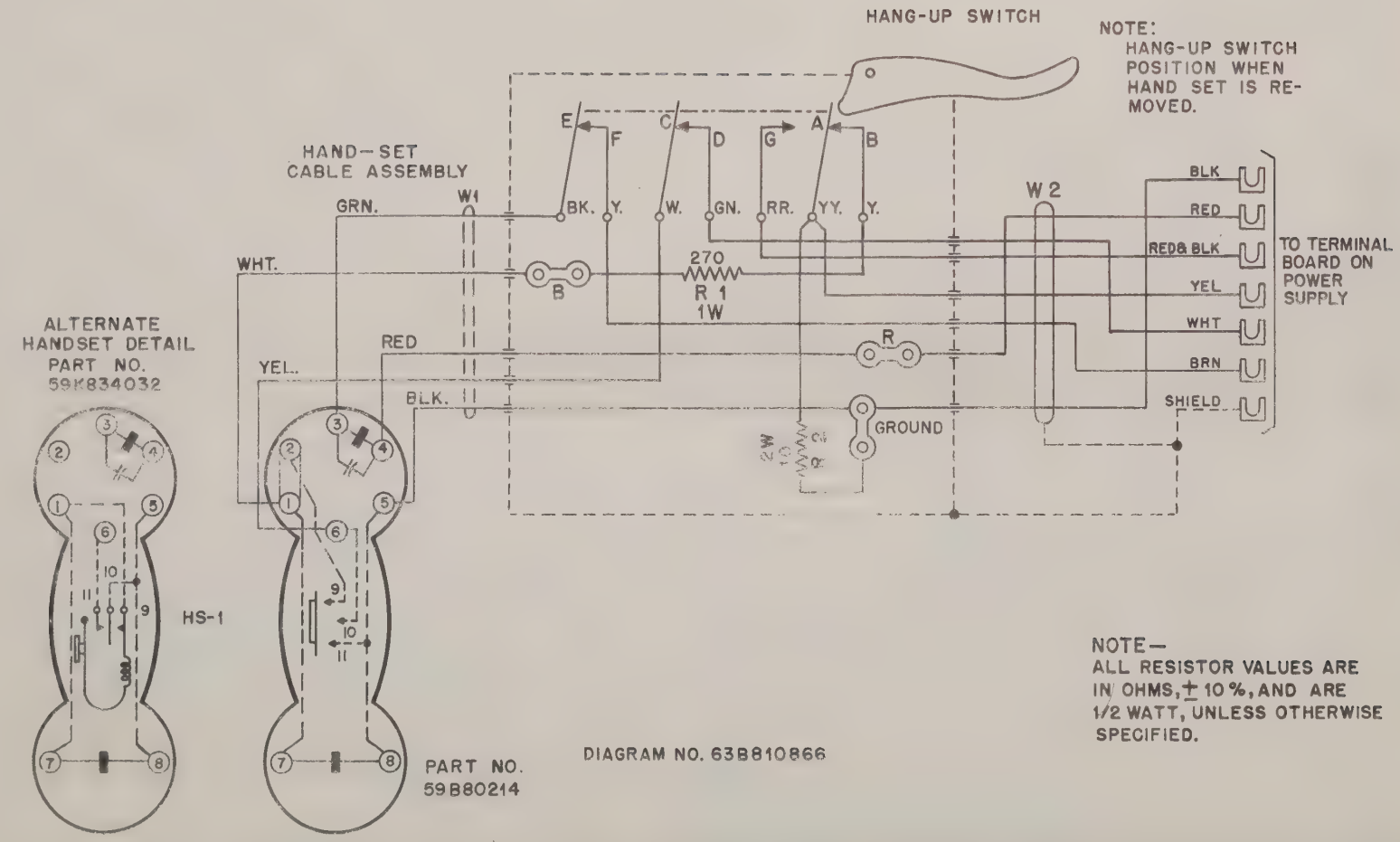


DIAGRAM NO. 63B810866

NOTE—
ALL RESISTOR VALUES ARE IN OHMS, ± 10%, AND ARE 1/2 WATT, UNLESS OTHERWISE SPECIFIED.

SINGLE-RECEIVER 80 AND 140 "BL" MODELS
INTERCABLING DIAGRAM

REFER TO INDIVIDUAL SCHEMATIC
FOR COMPLETE DETAIL OF EACH
CHASSIS

MOTOROLA
PART NO. 63E820535
ISSUE - C 10/54-CR

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram
63E820535

1. K-8495-BL (30 W) & K-8495-CL (60 W) Cable Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CONNECTORS,
J 1	9A880725	Plug: female; 12 contact; polarized; rectangular black phenolic base; p/o W 3
J 2	9K892736	Plug: female; 11 contact; polarized; round brown plastic base; p/o W 3; does not include 15A83157 SHELL, connector, or 41A483715 SPRING, connector shell; which must be ordered separately
J 3		Same as J 2; p/o W 3
J 4		Same as J 2; p/o W 3
		CONNECTORS,
P 1	28A42310	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 1
P 2	28K474006	Plug: male; single contact; round; bakelite insulator; p/o W 2; used only on non-coaxial relay on 30 watt equipment
	or 28A85558	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 2; used only on coaxial relay on 60 watt equipment
P 3		Same as P 1; p/o W 1
P 4	28A86870	Plug: male; 11 contact; polarized; round bakelite base; p/o W 3; does not include 15A483149 SHELL connector, or 41A483715 SPRING, connector shell; which must be ordered separately
P 5		Same as P 2 (28K474006) p/o W 2; except used on 30 and 60 watt equipment
P 6		Same as P 4; p/o W 3
P 7		Same as P 4; p/o W 3
P 8	28B891298	Plug: male; 12 contact; polarized; rectangular black bakelite insulator; p/o W 3
P 9	29K5404	Plug: male; single contact; pin type; coded; RED; p/o W 4
P 10	28A891117	Plug: male; 2 contact; polarized; round bakelite insulator; p/o W 4
		LINES, RF,
W 1	1K86604	Transmission: coaxial; Antenna Relay to Antenna Transmission Line; includes: 30B82345 CABLE, RF: RG-8/U; 22" long Reference Part P 1 and P 3
W 2	1V891415	Transmission: coaxial; Receiver to Antenna Relay; includes: 30K475378 CABLE, RF: RG-58A/U; 9-1/2" long Reference Part P 2 and P 5 (28K474006) (used only for non-coaxial relay on 30 watt equipment)
	or 1K891935	Transmission: coaxial: Receiver to Antenna Relay; includes: 30K475378 CABLE, RF: RG-58A/U; 9-1/2" length required Reference Part P 2 (28A85558) and P 5 (28K474006) (used only for coaxial relay on 60 watt equipment
		CABLE ASSEMBLIES,
W 3	1V891926	Interconnector; Power to Receiver and Transmitter; includes: 1V891927 CABLE ASSEMBLY: laced leads Reference Parts J 1, J 2, J 3, J 4, and P 4, P 6, P 7, and P 8
W 4	1V821386	Interconnector: Power to Meter Panel; Receiver and AC Outlet Panel; includes: 1V821386 CABLE ASSEMBLY: laced leads Reference Parts P 9 and P 10

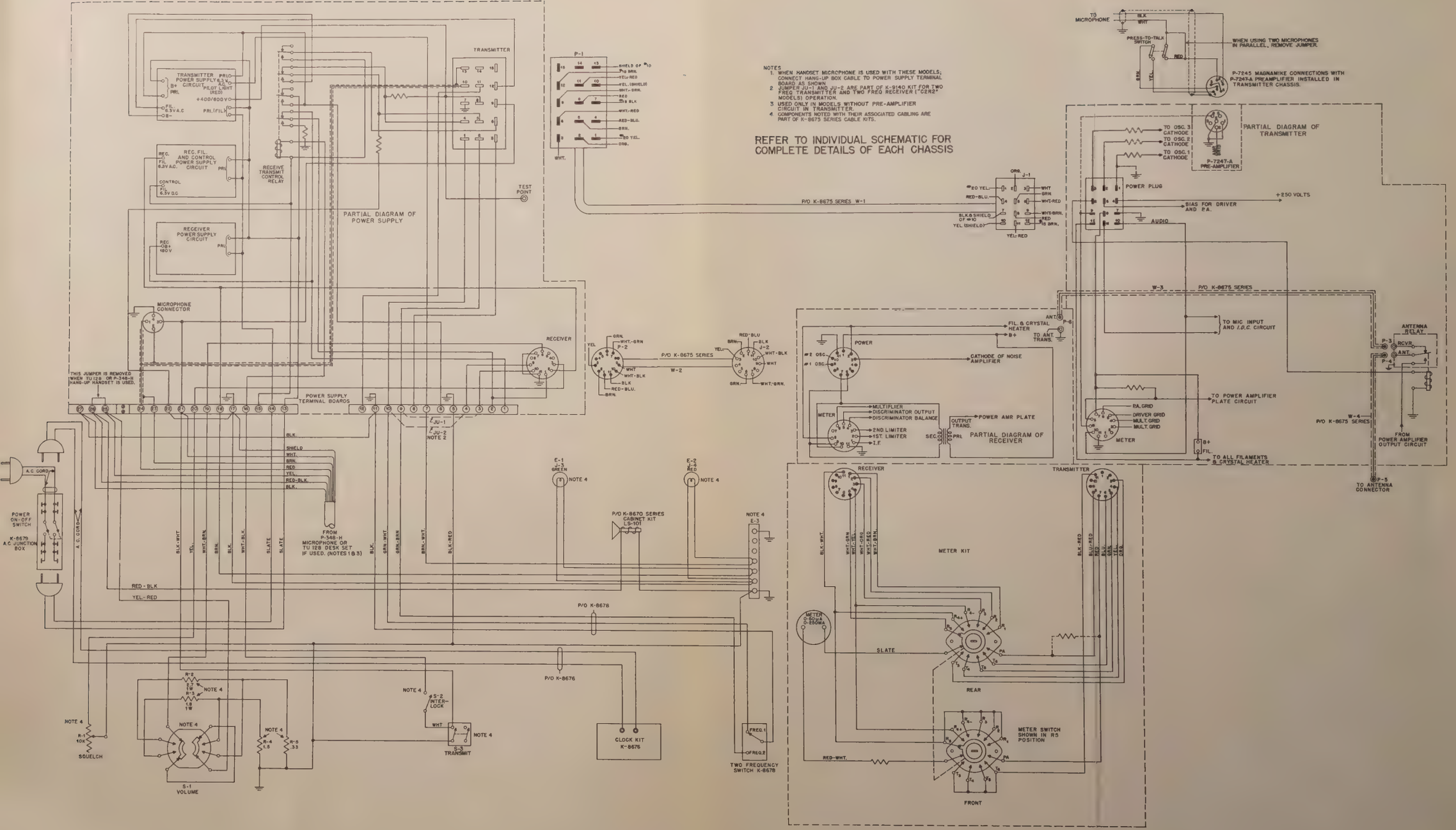
2. K-8496-BL Cabinet Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SPEAKER,
LS 101	50B475501	Magnetic: impedance 3.2 ohm; 4-1/2"
		CONNECTORS,
P 101	29K5405	Plug: male; single contact; pin type; coded BLACK
P 102	29K5407	Plug: male; single contact; pin type; coded WHITE
		SWITCHES,
S 101	40A80237	Interlock: S.P.S.T.; REAR DOOR
	or 40A811749	Interlock: S.P.S.T.; REAR DOOR
		NON-REFERENCED PARTS LIST
		LENS,
	60A80139	Indicator light: RED; includes bushing
	60K80140	Indicator light: GREEN; includes bushing
		CABLE,
	30A76858	2-conductor: rubber covered; 50" length required; for reference part LS 1

3. P-8659 Spare Fuse and AC Outlet Panel

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		HOLDER,
E 301	67B80179	Fuse: dual fuse mounting; for 2" long x 9/16" diameter fuses
		FUSES,
F 301	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt; 2" long x 9/16" diameter
F 302		Same as F 301
		CONNECTOR,
J 301	9A891865	Receptacle: female; dual 2 contacts AC Includes the following Spare Fuses
		FUSES,
	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
		FUSES,
	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt 2" long x 9/16" diameter

SINGLE-RECEIVER 80 AND 140 "BY" MODELS INTERCABLING DIAGRAM



MOTOROLA
PART NO. 63E891621
ISSUE - K 10/54-CP

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram
63E891621

1. K-8670, K-8670-A Cabinet Kit

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		SPEAKER,
	50B475501	Magnetic: impedance 3.2 ohm; 4-1/2"
NON-REFERENCED PARTS LIST		
		LENS,
	60A86101	Indicator light: RED; includes 42K86103 RING, retainer
	60K86102	Indicator light: GREEN; includes 42K86103 RING, retainer
		FUSES,
	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter; used only in K-8670
	or 65K817956	Cartridge: one time; slo-blo; glass; 5 ampere; 1-1/4" long x 1/4" diameter; used only in K-8670-A
	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter; used only in K-8670
	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter

2. K-8675 (30 W) and K-8675-C (60 W) Cable Kit

		LAMPS,
E 1	65X11854	Incandescent: 6-8 volt; .15 ampere; tubular; glass; bayonet base; single contact
E 2		Same as E 1
		BOARD,
E 3	31A891286	Terminal: 6 solder lug terminals
		CONNECTORS,
J 1	9A880725	Plug: female; 12 contact; polarized; rectangular; phenolic base; p/o W 1
J 2	9K892736	Plug: female; 11 contact; polarized; round brown plastic base; p/o W 2; does not include 15A483149 SHELL, connector or 41A483715 SPRING, connector shell, which must be ordered separately
		LAMPHOLDERS,
J 3	60A20781	Bayonet base; single contact; including mounting clips; does not include 41A472538 SPRING, backing or 43A472539 BUSHING, insulator and contact eyelet; which must be ordered separately
J 4		Same as J 3

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CONNECTORS,
P 1	28B891298	Plug: male; 15 contact; polarized; rectangular; black bakelite base; p/o W 1
P 2	28A86870	Plug: male; 11 contact; polarized; round; black phenolic base; p/o W 2; does not include 15A483149 SHELL, connector or 41A483715 SPRING, connector shell, which must be ordered separately; to RELAY CONNECTOR
	or 28B813576	Plug: male; 11 contact; polarized; round; black phenolic base; p/o W 2; does not include 15A483149 SHELL, connector or 41A483715 SPRING, connector shell; which must be ordered separately; to RELAY CONNECTOR
P 3	28A85558	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 3 (1K800571) used only with Coaxial Antenna Changeover Relay
	or 28K474006	Plug: male; single contact; round; bakelite insulator; p/o W 3; (1K892068) used only with Non-Coaxial Antenna Changeover Relay
P 4	28A42310	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 4
P 5		Same as P 4, p/o W 4
P 6	28K474006	Plug: male; single contact; round; bakelite insulator; to RECEIVER CONNECTOR; p/o W 3
		RESISTORS,
R 1	18A890193	Variable: wire-wound; 10,000 ohm ±10%; SQUELCH
R 2	17A890468	Fixed: wire-wound; 2.7 ohm ±10%; 1 w; ins.
R 3	17K890469	Fixed: wire-wound; 1.8 ohm ±10%; 1 w; ins.
R 4	17A890466	Fixed: wire-wound; 1.5 ohm ±10%; 1/2 w; ins.
R 5	17K890467	Fixed: wire-wound; .33 ohm ±10%; 1/2 w; ins.
		SWITCHES,
S 1	40A890196	Rotary: 2 pole; 3 positions; VOLUME
S 2	40A80237	Interlock: S.P.S.T.
	or 40A811749	Interlock: S.P.S.T.
S 3	40A475597	Toggle: D.P.S.T.; TRANSMIT
	or 40K811760	Toggle: D.P.S.T.; TRANSMIT
		CABLE ASSEMBLIES,
W 1	1V891290	Laced: interconnector; POWER to TRANSMITTER; includes; miscellaneous wire leads; reference parts P 1 and J 1
W 2	1V891289	Laced: interconnector; POWER to RECEIVER; includes; miscellaneous wire leads, reference parts J 2 and P 2
		LINES,
W 3	1K800571	RF: transmission; coaxial; interconnector; 15" long; RECEIVER to ANTENNA RELAY; includes: 30K475378 CABLE, RF: coaxial; RG-58A/U; 15" length required 28K474006 CONNECTOR, plug: male; single contact; reference part P 6 28A85558 CONNECTOR, plug: male; single contact; reference part P 3
		LINES, (used only with Coaxial Antenna Changeover Relay) 60 watt
	or 1K892068	RF: transmission; coaxial; interconnector; 15" length required; RECEIVER to ANTENNA RELAY; includes: 30K475376 CABLE, RF: coaxial; 58A/U; 15" length required 28K474006 CONNECTOR, plug: male; single contact; 2 required; reference part P 3 and P 6 (used only with non-coaxial Antenna Changeover Relay) 30 watt
W 4	1K86158	RF: transmission; coaxial; interconnector; 10 ft. long ANTENNA RELAY to ANTENNA TRANSMISSION LINE; includes: 30B82345 CABLE, RF: coaxial; RG-58A/U; 10 ft. long required Reference parts P 4 and P 5

3. K-8679 AC Junction Strip

		Includes the following non-referenced parts:
		CONNECTOR,
	9A891285	Receptacle: female; 2 contact; rectangular; black bakelite base; AC type; 5 used
		SWITCHES,
	40A474034	Toggle: D.P.S.T.
	or 40K811752	Toggle: D.P.S.T.
		BRACKET,
	7B891243	Connector mounting
		BUSHING,
	43K892292	Cable
		CABLE,
	30B892534	Special purpose: 2 conductor; rubber covered; each conductor #18 ga. 10 ft. long; includes 2 contact; male; AC connector

4. K-8676 Clock Kit

		Includes the following non-referenced parts:
		CLOCK,
	59B474954	Electric: 110 VAC; 60 cycle; direct reading
		BRACKET,
	7A475228	Clock mounting
		CABLE,
	30B892963	Special purpose: 2 conductor; rubber covered; each conductor #18 ga.; 42-1/2" long; includes 2 contact male AC connectors
		CONNECTOR,
	29A812980	Terminal: closed end; 2 used

5. K-8678 Two-Frequency Transmitter Kit

		Includes the following non-referenced parts:
		SWITCHES,
	40A80248	Toggle: S.P.D.T.
	or 40K811753	Toggle: S.P.D.T.

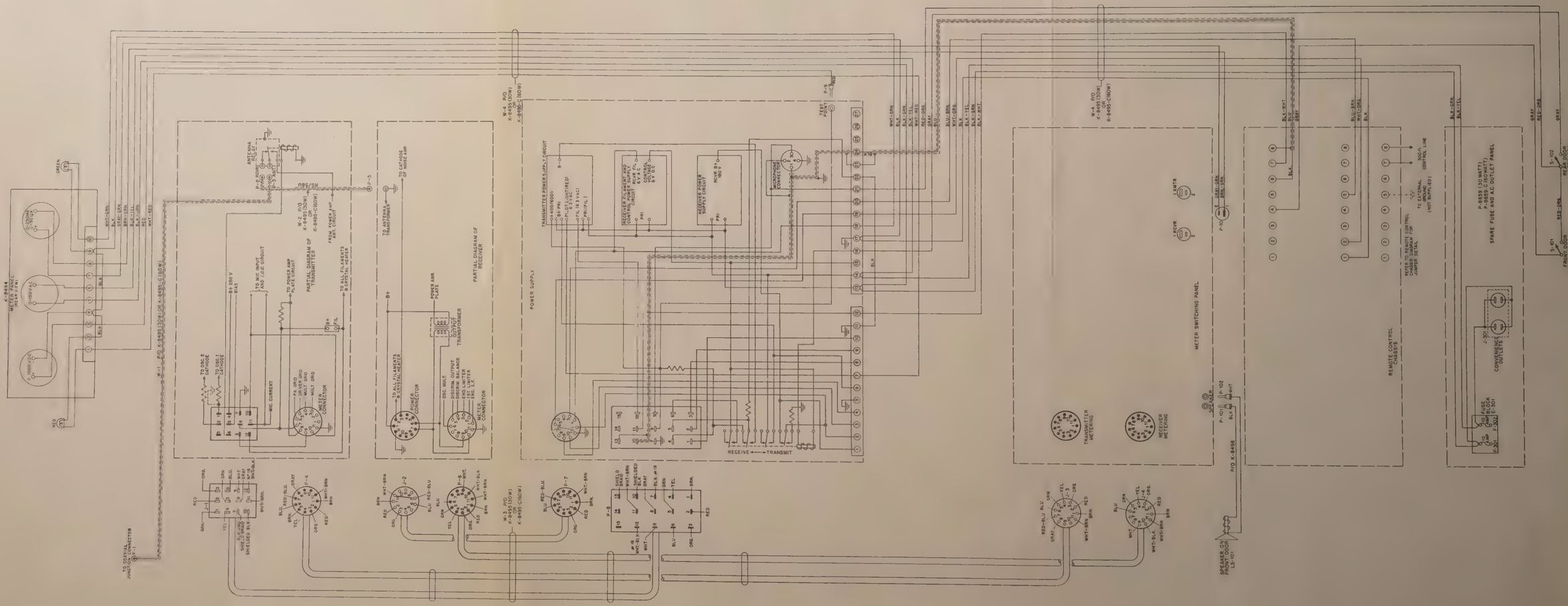
REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		PLATE,
	64A891295	Switch: F 1, F 2

6. K-9140 C2R2 Operation Kit (Power Supply)

		LEADS,
JU 1	1V802887	Electrical: jumper; consisting of: 10M488291 WIRE: #20 ga. stranded; insulated; coded GRN-BRN; 4" long required 29R3041 LUG, terminal: #8; 2 required 37K61348 SLEEVE, neoprene; 2 required
JU 2	1V802886	Electrical: jumper; consisting of: 10M488285 WIRE: #20 ga. stranded; insulated; coded; GRN-WHT; 4" long required 29R3041 LUG, terminal: #8; 2 required 37K61348 SLEEVE, neoprene; 2 required

SINGLE-RECEIVER 80 AND 140 "BR" MODELS
INTERCABLING DIAGRAM

REFER TO INDIVIDUAL SCHEMATIC
FOR COMPLETE DETAIL OF EACH
CHASSIS


POWER SUPPLY
METER SWITCHING PANEL
REMOTE CONTROL CHASSIS
PARTIAL DIAGRAM OF RECEIVER
PARTIAL DIAGRAM OF TRANSMITTER
TO ANTENNA RELAY
TO ANTENNA TRANSFORMER
TO LATCHCORD OF HOUSE PHONE
TO MIC INPUT AND /OC CIRCUIT
TO POWER AMP PLATE CIRCUIT
TO ALL FILAMENTS & CRYSTAL HEATER
FROM POWER AMP ANT. CIRCUIT
POWER AMP PLATE
OUTPUT TRANSFORMER
METER CONNECTOR
RECEIVER FILAMENT AND CONTROL POWER SUPPLY 6V A.C.
RECEIVER POWER SUPPLY CIRCUIT
RECEIVER B+ 180 V
TRANSMITTER POWER SUPPLY CIRCUIT
TEST POINT
RECEIVE ←→ TRANSMIT
TRANSMITTER METERING
RECEIVER METERING
SPEAKER ON FRONT DOOR LS 101
CONVENIENCE OUTLETS
FUSE AND BLOCK ASSEMBLY
SPARE FUSE AND AC OUTLET PANEL
REAR DOOR SPEAKER
FRONT DOOR SPEAKER
TO EXTERNAL GROUND (NOT SUPPLIED)
TO COAXIAL JUNCTION BOX J-1
W-1 P/O K-8495 (10W) OR K-8495-C (60W)
W-2 P/O K-8495 (10W) OR K-8495-C (60W)
W-3 P/O K-8495 (10W) OR K-8495-C (60W)
W-4 P/O K-8495 (10W) OR K-8495-C (60W)

MOTOROLA
PART NO. 63E891622
ISSUE - J 10/54-CP

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram
63E891622

1. K-8495 (30 W), K-8495-C (60 W), and K-8495-CL Cable Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CONNECTORS,
J 1	9A880725	Plug: female; 12 contact; polarized; rectangular; black phenolic base; to TRANSMITTER CONNECTOR; p/o W 3
J 2	9K892736	Plug: female; 11 contact; polarized; round; brown plastic base; to RECEIVER POWER CONNECTOR; p/o W 3; does not include 15A83157 SHELL, connector or 41A483715 SPRING, connector shell, which must be ordered separately
J 3		Same as J 2; except to TRANSMITTER METERING CONNECTOR; p/o W 3
J 4		Same as J 2; except to RECEIVER METERING CONNECTOR; p/o W 3
		CONNECTORS,
P 1	28A42310	Plug: male; single contact; round; bakelite insulator; to ANTENNA TRANSMISSION LINE; p/o W 1
P 2	28K474006	Plug: male; single contact; round; bakelite insulator; to RECEIVER ANTENNA RELAY; p/o W 2 (1V891415)
	or 28A85558	Plug: male; single contact; round; mica filled bakelite insulator; to RECEIVER ANTENNA RELAY; p/o W 2 (1K891935)
P 3		Same as P 1; except to ANTENNA RELAY; p/o W 1
P 4	28B813576	Plug: male; 11 contact; polarized; round; black phenolic base; to TRANSMITTER METER CONNECTOR; p/o W 3; does not include 15A483149 SHELL, connector or 41A483715 SPRING, connector; which must be ordered separately
P 5		Same as P 2 (28K474006) except to RCVR CON; p/o W 2 (1K891935)
P 6		Same as P 4 except does not include 15A83157 SHELL, connector or 41A483715 SPRING, connector shell, which must be ordered separately and except to RECEIVER METER CONNECTOR; p/o W 3
P 7		Same as P 4 except does not include 15A83157 SHELL, connector or 41A483715 SPRING, connector shell, which must be ordered separately and except to POWER SUPPLY CONNECTOR; p/o W 3
P 8	28B891298	Plug: male; 15 contact; polarized; rectangular; black bakelite base; to POWER SUPPLY CONNECTOR; p/o W 3
P 9	29K5404	CONNECTORS, Plug: male; 2 contact; polarized; round; pin type; bakelite base; to TEST POINT; p/o W 4
P 10	28A891117	Plug: male; 2 contact; polarized; round; bakelite insulator; to RECEIVER #1 or TRANSMITTER #2 METER SWITCHING CONNECTOR; p/o W 4
		LINES, RF,
W 1	1K86604	Transmission: coaxial; ANTENNA RELAY to ANTENNA TRANSMISSION LINE CONNECTOR; includes: 30B82345 CABLE, RF: coaxial; RG-8/U; 22" long required Reference Parts P 1 and P 3
W 2	1V891415	Transmission: coaxial; RECEIVER to ANTENNA RELAY; includes: 30K475378 CABLE, RF: coaxial; RG-58A/U; 9-1/2" long required Reference Parts P 2 (28K474006) and P 5 (28K474006) (used only with P-8495)
	or 1K891935	Transmission: coaxial; RECEIVER to ANTENNA RELAY; includes: 30K475378 CABLE, RF: coaxial RG-58/U; 9-1/2" length required Reference Part P 2 (28A85558) and P 5 (28K474006) (used only with K-8495-C and K-8495-CL)
		CABLE ASSEMBLIES,
W 3	1V891926	Laced: POWER CONTROL INTERCONNECTOR; includes: 1V891927 CABLE ASSEMBLY: laced leads only Reference Parts J 1, J 2, J 3, J 4, P 4, P 6, P 7, and P 8
W 4	1V891971	Laced: METERING, REMOTE and POWER INTERCONNECTOR; includes: 1V891972 CABLE ASSEMBLY: laced leads only Reference Parts P 9 and P 10

2. K-8496 Cabinet Kit

		SPEAKER,
LS 101	50B475501	Magnetic: impedance 3.2 ohm; 4-1/2"
		CONNECTORS,
P 101	29K5405	Plug: male; single contact; pin type; coded BLACK
P 102	29K5407	Plug: male; single contact; pin type; coded WHITE
		SWITCHES,
S 101	40A80237	Interlock: S.P.S.T.; FRONT DOOR
	or 40A811749	Interlock: S.P.S.T.; FRONT DOOR
S 102		Same as S 101 except REAR DOOR

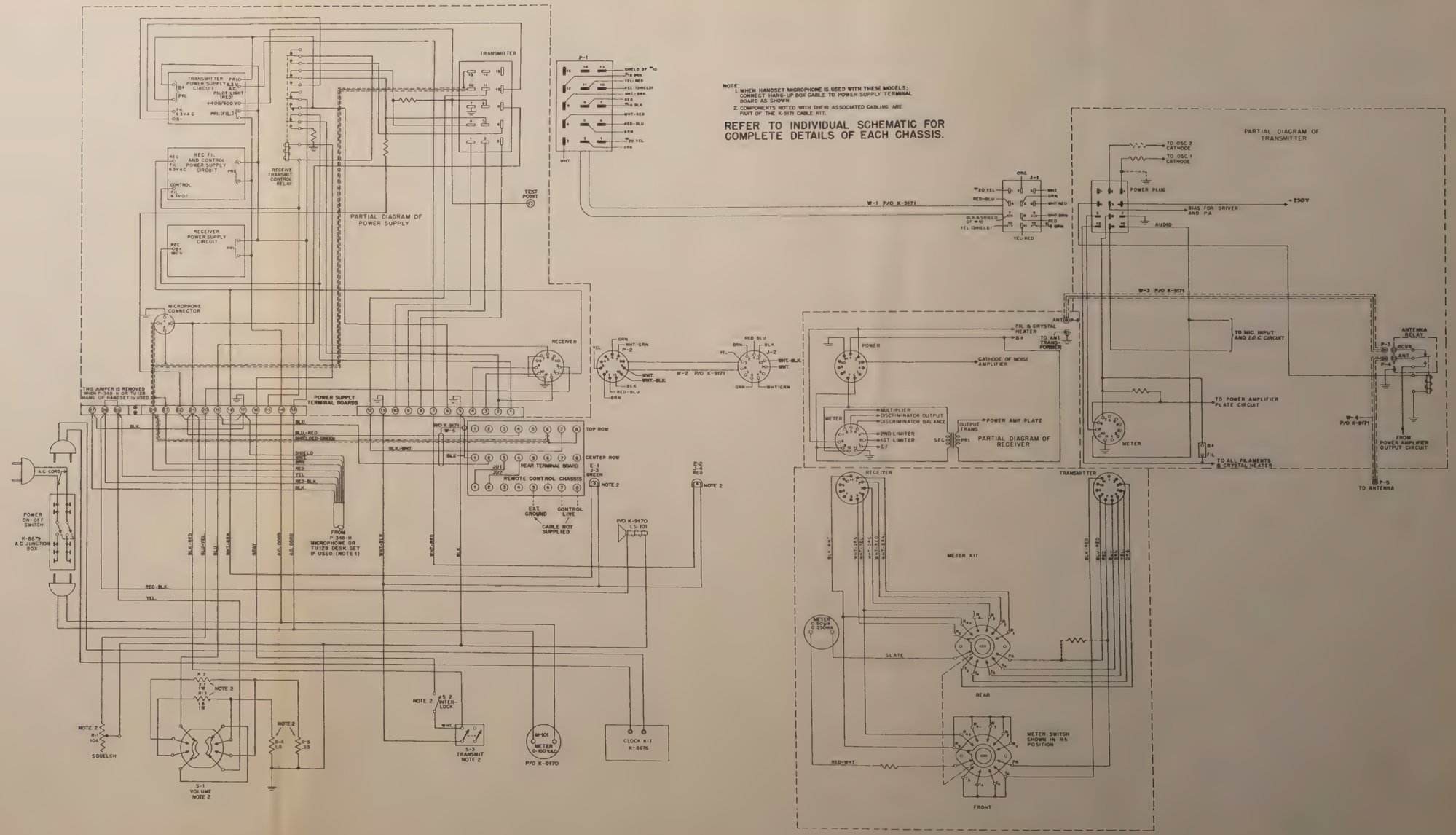
NON-REFERENCED PARTS LIST

		CABLE,
	30A76858	2 conductor: rubber covered; #18 ga.; 50" length required; part for LS 101
	60A80139	Indicator light; RED; includes bushing & mounting hardware
	60K80140	Indicator light: GREEN; includes bushing & mounting hardware

3. P-8659 Spare Fuse & AC Outlet Panel

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		HOLDER,
E 301	67B80179	Fuse: dual fuse mounting; for 2" long x 9/16" diameter fuses
		FUSES,
F 301	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt; 2" long x 9/16" diameter
F 302		Same as F 301
		CONNECTOR,
J 301	9A891865	Receptacle: female; dual 2 contact AC Includes the following Spare Fuses:
		FUSES,
	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt; 2" long x 9/16" diameter

SINGLE-RECEIVER 80 AND 140 "BYR" MODELS INTERCABLING DIAGRAM



MOTOROLA
PART NO. 63E802368
ISSUE - F 10/54-CP

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram
63E802368

1. K-9170 Cabinet Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SPEAKER,
LS 101	50B475501	Magnetic: 3.2 ohm voice coil; 4-1/2"
		METER,
M 101	52B891586	Voltmeter: 0-150 VAC; 3" case
		NON-REFERENCED PARTS LIST
		LENS,
	60A86101	Indicator light: RED; includes retainer ring
	60A86102	Indicator light: GREEN; includes retainer ring

2. K-9171 Cable Kit

		LAMPS,
E 1	65X11854	Incandescent: 6-8 volt; 1 w; .15 ampere; tubular; glass; single contact; bayonet base
E 2		Same as E 1
		CONNECTORS,
J 1	9A880725	Plug: female; 12 contact; polarized; rectangular; phenolic base; p/o W 1; to TRANSMITTER CONNECTOR
J 2	9K892736	Plug: female; 11 contact; polarized; round; brown plastic base; p/o W 2; to RECEIVER CONNECTOR; does not include 15A483149 SHELL, connector or 41A483715 SPRING, shell connector; which must be ordered separately
		LAMPHOLDERS,
J 3	60A20781	Single contact; bayonet base; including mounting clip; does not include 41A472538 SPRING, lampholder backing or 43A472539 BUSHING, insulator and contact eyelet; which must be ordered separately
J 4		Same as J 3
		CONNECTORS,
P 1	28B891298	Plug: male; 15 contact; polarized; rectangular; black bakelite base; p/o W 1; to POWER CONNECTOR
P 2	28A86870	Plug: male; 11 contact; polarized; round; black phenolic base; p/o W 2; to POWER CONNECTOR; does not include 15A483149 SHELL, connector or 41A483715 SPRING, shell connector; which must be ordered separately
P 3	28A85558	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 3; to RELAY RECEIVER CONNECTOR
P 4	28A42310	CONNECTORS, Plug: male; single contact; round; mica filled bakelite insulator; p/o W 4; to ANTENNA RELAY CONNECTOR
P 5		Same as P 4 except p/o W 4; to ANTENNA TRANSMISSION LINE
P 6	28K474006	Plug: male; single contact; round; bakelite insulator; to RECEIVER ANTENNA CONNECTOR; p/o W 4
		RESISTORS,
R 1	18A890193	Variable: wire-wound; 10,000 ohm ±10%; SQUELCH
R 2	17A890468	Fixed: wire-wound; 2.7 ohm ±10%; 1 w; ins.
R 3	17K890469	Fixed: wire-wound; 1.8 ohm ±10%; 1 w; ins.
R 4	17A890466	Fixed: wire-wound; 1.5 ohm ±10%; 1/2 w; ins.
R 5	17K890467	Fixed: wire-wound; .33 ohm ±10%; 1/2 w; ins.
		SWITCHES,
S 1	40A890196	Rotary: 2 pole; 3 position; VOLUME
S 2	40A80237 or 40A811749	Interlock: S.P.S.T. Interlock: S.P.S.T.
S 3	40A475597 or 40K811760	Toggle: D.P.S.T.; TRANSMIT Toggle: D.P.S.T.; TRANSMIT
		CABLE ASSEMBLIES,
W 1	1V891290	Laced: RECEIVER to POWER; includes reference parts P 1 and J 1
W 2	1V891289	Laced: TRANSMITTER to POWER includes reference parts J 2 and P 2
		LINES,
W 3	1K893017	RF: transmission; coaxial; RECEIVER to ANTENNA RELAY; includes: 30K475378 CABLE, RF: coaxial; RG-58A/U; 18" long required Reference Part P 3 (28A85558) and P 6 (28K474006)
W 4	1K86158	RF: transmission; coaxial; ANTENNA RELAY to ANTENNA TRANSMISSION LINE; includes: 30B82345 CABLE, RF: coaxial; RG-8/U; 10 ft. required Reference Part P 4 and P 5

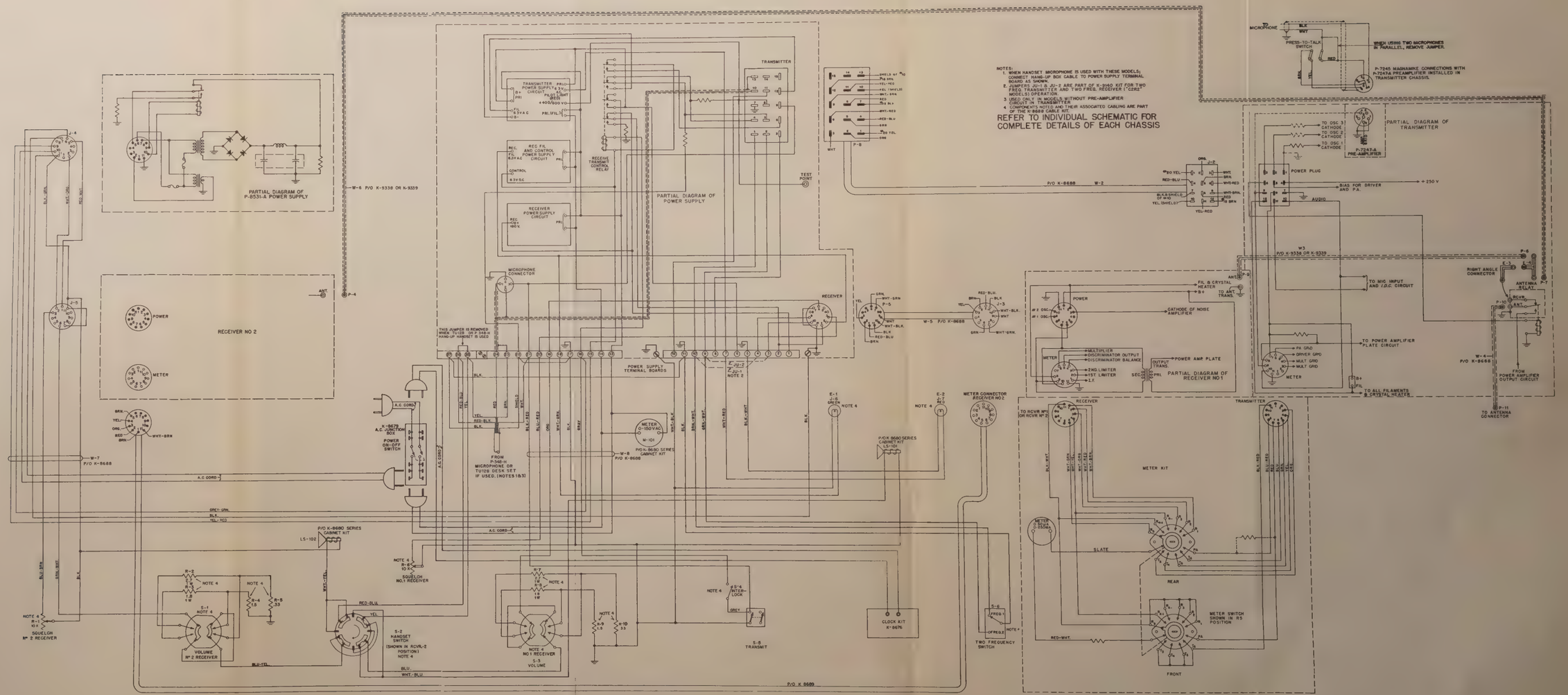
3. K-8679 AC Junction Strip

		Includes the following non-referenced parts:
		CONNECTOR,
	9A891285	Receptacle: female; 2 contact; rectangular; black bakelite base; AC type; 5 used
		SWITCHES,
	40A474034 or 40K811752	Toggle: D.P.S.T. Toggle: D.P.S.T.
		BRACKET,
	7B891243	Connector mounting
		BUSHING,
	43K892292	Cable
		CABLE,
	30B892534	Special purpose: 2 conductor; rubber covered; each conductor #18 ga. 10 ft. long; includes 2 contact male AC connector

4. K-8676 Clock Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		Includes the following non-referenced parts:
		CLOCK,
	59B474954	Electric: 110 VAC; 60 cycle; direct reading
		BRACKET,
	7A475228	Clock Mounting
		CABLE,
	30B892963	Special purpose: 2 conductor; rubber covered; each conductor #18 ga.; 42-1/2" long; includes 2 contact male AC connectors
		CONNECTOR,
	29A812980	Terminal: closed end; 2 used

TWO-RECEIVER 80 AND 140 "BY" MODELS INTERCABLING DIAGRAM



MOTOROLA
PART NO. 63E891630
ISSUE - J 10/54-CP

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram-
63E891630

1. K-8680 and K-8680-A Cabinet Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SPEAKERS,
LS 101	50B475501	Magnetic: 3.2 ohm voice coil; 4-1/2"
LS 102		Same as LS 101
		METER,
M 101	52B891586	Voltmeter: 0 to 150 volt; AC; 3" case

NON-REFERENCED PARTS LIST

		LENS,
	60A86101	Indicator light: RED; includes retainer ring
	60K86102	Indicator light: GREEN; includes retainer ring
		FUSES,
	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter; used only in K-8680
	or 65K817956	Cartridge: one time; slo-blo; glass; 5 ampere; 125 volt; 1-1/4" long x 1/4" diameter; used only in K-8680-A
	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter; used only in K-8680
	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter

2. K-8688 Cable Kit

		LAMPS,
E 1	65X11854	Incandescent: 6-8 volt; .15 ampere 1 w; tubular; glass; single contact; bayonet base
E 2		Same as E 1
		ADAPTORS,
E 3	28A48250	Connector: 90° ; male; single contact; female; single contact
E 4	9A86150	Connector: "T"; 2 female; single contact; 1 male; single contact
		CONNECTORS,
J 1		p/o K-8689 Series Metering Kit Section
J 2	9A880725	Plug: female; 12 contact; polarized; rectangular; phenolic base; p/o W 2
J 3	9K892736	Plug: female; 11 contact; polarized; round; brown plastic base; p/o W 5; does not include 15A483149 SHELL, connector; which must be ordered separately
J 4	9A86864	Plug: female; 11 contact; polarized; round; black plastic base; p/o W 7; does not include 15A483149 SHELL, connector; which must be ordered separately
J 5		Same as J 4 except p/o W 7
		LAMPHOLDERS,
J 6	60A20781	Single contact; bayonet base; including mounting clip; p/o W 8; does not include 41A472538 SPRING, lampholder backing or 43A472539 BUSHING, insulator and contact eyelet; which must be ordered separately
J 7		Same as J 6 except p/o W 7
		CONNECTORS,
P 1		NOT USED
P 2		NOT USED
P 3		NOT USED
P 4		p/o K-9338 Antenna Matching Cable Kit Section
P 5	28B813576	Plug: male; 11 contact; polarized; round; black phenolic base; p/o W 5; does not include 15A483149 SHELL, connector; which must be ordered separately
P 6		p/o K-9338 Antenna Matching Cable Kit Section
P 7		p/o K-9338 Antenna Matching Cable Kit Section
P 8	28B891298	Plug: male; 15 contact; polarized; rectangular; black phenolic base; p/o W 2
P 9		p/o K-9338 Antenna Matching Cable Kit Section
P 10	28A42310	Plug: male; single contact; round; mica filled bakelite insulator; p/o W 4
P 11		Same as P 10 except p/o W 4
		RESISTORS,
R 1	18A890193	Variable: wire-wound; 10,000 ohm ±10%; SQUELCH RECEIVER #2; p/o W 7
R 2	17A890468	Fixed: wire-wound; 2.7 ohm ±10%; 1 w; ins.; p/o W 7
R 3	17K890469	Fixed: wire-wound; 1.8 ohm ±10%; 1 w; ins.; p/o W 7
R 4	17A890466	Fixed: wire-wound; 1.5 ohm ±10%; 1/2 w; ins.; p/o W 7
R 5	17K890467	Fixed: wire-wound; .33 ohm ±10%; 1/2 w; ins.; p/o W 7
R 6		Same as R 1 except SQUELCH RECEIVER #1 p/o W 8
R 7		Same as R 2 except p/o W 8
R 8		Same as R 3 except p/o W 8
R 9		Same as R 4 except p/o W 8
R 10		Same as R 5 except p/o W 8
		SWITCHES,
S 1	40A890196	Rotary: 2 pole; 3 position; VOLUME #2 RECEIVER, p/o W 7
S 2	40B893324	Rotary: 4 pole; 2 position; p/o W 7
S 3		Same as S 1 except VOLUME #1 RECEIVER; p/o W 8
S 4	40A80237	Interlock: S.P.S.T.; p/o W 7
	or 40A811749	Interlock: S.P.S.T.; p/o W 7
S 5	40A475597	Toggle: D.P.S.T.; TRANSMIT; p/o W 8
	or 40K811760	Toggle: D.P.S.T.; TRANSMIT; p/o W 8
S 6	40A80248	Toggle: S.P.D.T.; 2-Frequency; p/o W 7
	or 40K811753	Toggle: S.P.D.T.; 2-Frequency; p/o W 7
W 1		CABLE ASSEMBLIES, Part of K-8689 Series Metering Kit Section
W 2	1V891290	Transmitter to Power; laced; includes: Reference Parts J 2 and P 8
W 3		p/o K-9338 Antenna Matching Cable Kit Section
		LINE,
W 4	1K86158	RF: transmission; coaxial; RELAY to ANTENNA TRANSMISSION LINE; includes: 30B82345 CABLE, coaxial; RG-8/U; 10 ft. long; and reference parts P 10 and P 11
		CABLE ASSEMBLIES,
W 5	1V891289	Receiver to Power; laced; includes Reference parts J 3 and P 5
W 6		p/o K-9338 Antenna Matching Cable Kit Section
W 7	1V893018	Laced; interconnect; includes: 1V893019 CABLE ASSEMBLY: laced leads only 30K893323 CABLE ASSEMBLY: 2 conductor; AC line; 6 ft. long; includes; 2 contact male AC connector and Reference Parts J 4, J 5, J 7, S 1, S 2, S 4, S 6, R 1, R 2, R 3, R 4 and R 5
W 8	1V893021	Laced; interconnect; includes: 1V893022 CABLE ASSEMBLY: laced leads only and Reference Parts J 6, R 6, R 7, R 8, R 9, R 10, S 3, S 5

3. K-8679 AC Junction Strip

		Includes the following non-referenced parts:
	9A891285	CONNECTOR, Receptacle: female; 2 contact; rectangular; black bakelite base; AC type; 5 used
	40A474034 or 40K811752	SWITCHES, Toggle: D.P.S.T. Toggle: D.P.S.T.
	7B891243	BRACKET, Connector mounting
	43K892292	BUSHING, Cable
	30B892534	CABLE, Special purpose: 2 conductor; rubber covered; each conductor #18 ga. 10 ft. long; includes 2 contact male AC connector

4. K-8676 Clock Kit

		Includes the following non-referenced parts:
	59B474954	CLOCK, Electric: 110 VAC; 60 cycle; direct reading
	7A475228	BRACKET, Clock mounting
	30B892963	CABLE, Special purpose: 2 conductor; rubber covered; each conductor #18 ga.; 42-1/2" long; includes 2 contact male AC connectors
	29A812980	CONNECTOR, Terminal: closed end; 2 used

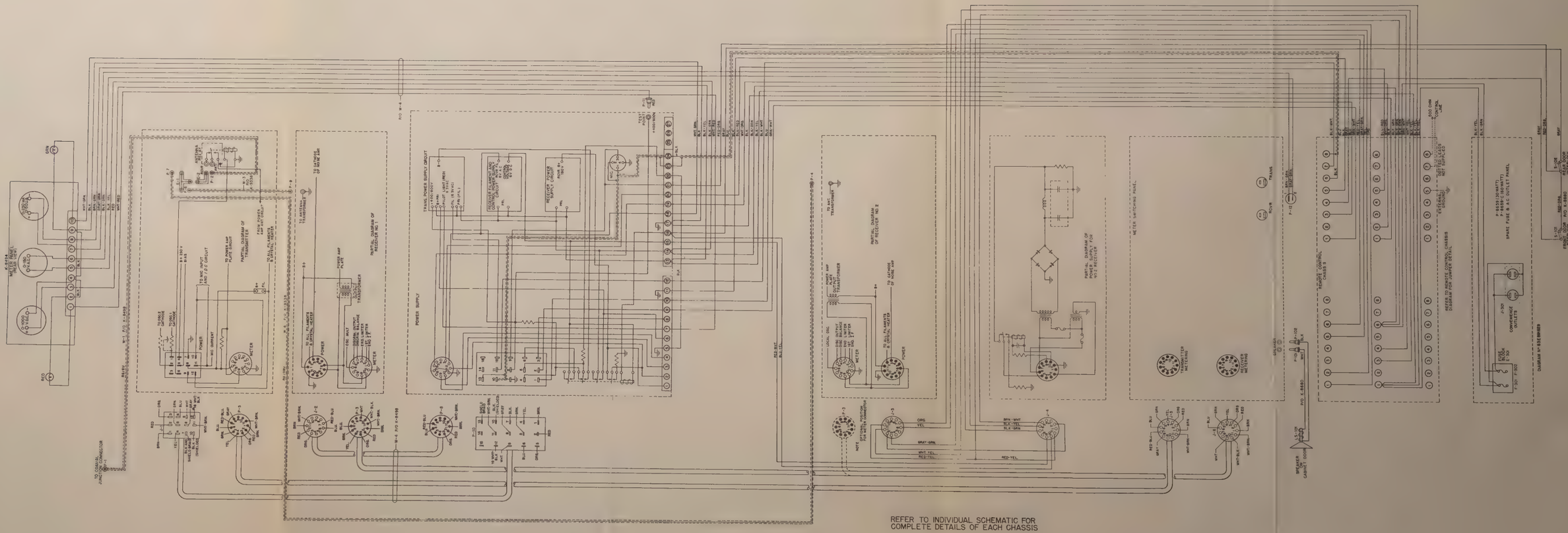
5. K-9339 Antenna Matching Cable Kit

		CONNECTORS,
P 4	28K474006	Plug: male; single contact; round; bakelite insulator; connects to RECEIVER #2; p/o W 6
P 6	28A85558	Plug: male; single contact; round; mica filled bakelite insulator; connects to RELAY; p/o W 3
P 7		Same as P 6 except connects to RELAY; p/o W 6
P 9		Same as P 4 except connects to RECEIVER #1, p/o W 3
		LINE,
W 3	1K821983	RF: transmission: coaxial; RELAY to RECEIVER; includes: 30K475378 CABLE, RF: coaxial; RG-58A/U; 36" length required Reference Parts P 6 and P 9
W 6		Same as W 3 except includes reference parts P 4 and P 7 in place of P 6 and P 9

6. K-9140 C2R2 Operation Kit (Power Supply)

		LEADS,
JU 1	1V802887	Electrical: jumper; consisting of: 10M488291 WIRE: #20 ga. stranded; insulated; coded; GRN-BRN; 4" long required 29R3041 LUG, terminal: #8; 2 required 37K61348 SLEEVE, neoprene; 2 required
JU 2	1V802886	Electrical: jumper; consisting of: 10M488285 WIRE: #20 ga. stranded; insulated; coded; GRN-WHT; 4" long required 29R3041 LUG, terminal: #8; 2 required 37K61348 SLEEVE, neoprene; 2 required

TWO-RECEIVER 80 AND 140 "BR" MODELS INTERCABLING DIAGRAM



REFER TO INDIVIDUAL SCHEMATIC FOR COMPLETE DETAILS OF EACH CHASSIS

MOTOROLA
PART NO. 63E891629
ISSUE - H 10/54-CP

INTERCABLING DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., cable kits, cabinet kits, etc. When ordering replacement parts specify part number, description, intercabling diagram number, diagram issue, and reference symbol of part.

Reference:
Intercabling Diagram
63E891629

1. P-8659 Spare Fuse and AC Outlet Panel

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		HOLDER,
E 301	67B80179	Fuse: dual fuse mounting; for 2" long x 9/16" diameter fuses
		FUSES,
F 301	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt; 2" long x 9/16" diameter
F 302		Same as F 301
		CONNECTOR,
J 301	9A891865	Receptacle: female; dual 2 contacts; AC Includes the following Spare Fuses:
		FUSES,
	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	65K80185	Cartridge: one time; paper; 10 ampere; 250 volt; 2" long x 9/16" diameter

2. P-8659-C Spare Fuse and AC Outlet Panel

The P-8659-C Spare Fuse and AC Outlet Panel utilizes the same parts and spare fuses as the P-8659 except for the following changes in the spare fuses.

		FUSES,
	OMIT 65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
	ADD 65K817956	Cartridge: one time; slo-blo; glass; 5 ampere; 125 volt; 1-1/4" long x 1/4" diameter

3. K-8498 Cable Kit

		ADAPTORS,
E 1	9A86150	Connector: "T"; 2 female; single contact; 1 male single contact
E 2	28A48250	Connector: 90°; male; single contact; female; single contact
		CONNECTOR,
J 1	9A880725	Plug: female; 12 contact; polarized; rectangular; phenolic base; to TRANSMITTER POWER CONNECTOR; p/o W 4
		CONNECTORS,
J 2	9K892736	Plug: female; 11 contact; polarized; round; black plastic base; to RECEIVER #1 POWER CONNECTOR; p/o W 4
J 3		Same as J 2 except to RECEIVER #2 POWER CONNECTOR; p/o W 4
J 4		Same as J 2 except to RECEIVER #2 POWER SUPPLY CONNECTOR p/o W 4
J 5		Same as J 2 except to TRANSMITTER METERING CONNECTOR; p/o W 4
J 6		Same as J 2 except to RECEIVER METERING CONNECTOR; p/o W 4
		CONNECTORS,
P 1	28A42310	Plug: male; single contact; round; bakelite insulator; to ANTENNA TRANSMISSIONLINE; p/o W 1
P 2		Same as P 1 except to ANTENNA RELAY CONNECTOR; p/o W 1
P 3	28B813576	Plug: male; 11 contact; polarized; round; black phenolic base; to RECEIVER #1 METER CONNECTOR; p/o W 4
P 4		For Parts List see K-9338 Cable Kit Section
P 5		Same as P 3 except to TRANSMITTER METER CONNECTOR; p/o W 4
P 6		For Parts List see K-9338 Cable Kit Section
P 7		For Parts List see K-9338 Cable Kit Section
P 8		Same as P 3 except to POWER SUPPLY; p/o W 4
P 9		For Parts List see K-9338 Cable Kit Section
P 10	28B891298	Plug: male; 15 contact; polarized; rectangular; black bakelite base; to POWER SUPPLY CONNECTOR; p/o W 4
P 11	29K5404	Plug: male; single contact; pin type; coded; RED to POWER SUPPLY test point; p/o W 4
P 12	28A891117	Plug: male; 2 contact; polarized; round; bakelite base; to RECEIVER or TRANSMITTER METER SWITCHING CONNECTOR; p/o W 4
		LINES, RF,
W 1	1K86604	Transmission: coaxial; RELAY to ANTENNA TRANSMISSION LINE; includes: 30B82345 CABLE, RF: coaxial RG-8/U; 22" long required Reference Parts P 1, P 2
W 2		NOT USED
W 3		For Parts List see K-9338 Cable Kit Section
		CABLE ASSEMBLIES,
W 4	1V892609	Laced; interconnector; includes: 1V892611 CABLE ASSEMBLY: laced leads only Reference Parts J 1, J 2, J 3, J 4, J 5, J 6, P 3, P 5, P 8, P 10, P 11, P 12
W 5		NOT USED
W 6		For Parts List see K-9338 Cable Kit Section

4. K-8660 Cabinet Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SPEAKER,
LS 101	50B475501	Magnetic: 3.2 ohm voice coil; 4-1/2"
		CONNECTORS,
P 101	29K5407	Plug: male; single contact; pin type; coded WHITE
P 102	29K5405	Plug: male; single contact; pin type; coded BLACK
		SWITCHES,
S 101	40A80237	Interlock: S.P.S.T.; FRONT DOOR
	or 40A811749	Interlock: S.P.S.T.; FRONT DOOR
S 102		Same as S 101 except REAR DOOR
		NON-REFERENCED PARTS LIST
		LENS,
	60A80139	Indicator light: RED; includes bushing and mounting hardware
	60K80140	Indicator light: GREEN; includes bushing and mounting hardware
		CABLE,
	30A76858	2 conductor; rubber covered; #18 ga.; 58-1/2" length required, part for LS 101

5. K-9339 Antenna Matching Cable Kit

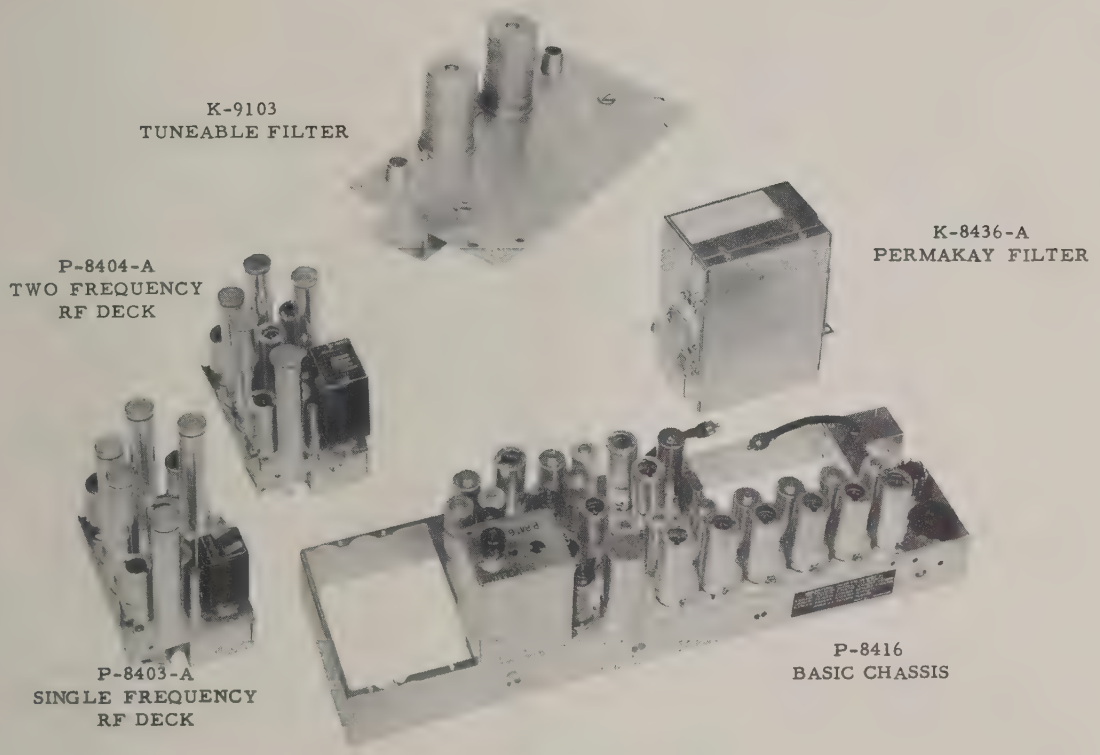
		CONNECTORS,
P 4	28K474006	Plug: male; single contact; round; bakelite insulator; connects to RECEIVER #2; p/o W 6
P 6	28A85558	Plug: male; single contact; round; mica filled bakelite insulator; connects to RELAY; p/o W 3
P 7		Same as P 6 except connects to RELAY; p/o W 6
P 9		Same as P 4 except connects to RECEIVER #1, p/o W 3
		LINE, RF,
W 3	1K821983	Transmission: coaxial; RELAY to RECEIVER; includes: 30K475378 CABLE, RF: coaxial; RG-58A/U; 36" length required Reference Parts P 6 and P 9
W 6		Same as W 3 except includes reference parts P 4 and P 7 in place of P 6 and P 9

Motorola®

THE "RESEARCH" LINE

SENSICON RECEIVER CHASSIS

152-174 MC. BASE STATION



CHASSIS	DESCRIPTION
PA-8433-A	Single-frequency; with PERMAKAY filter
*PA-8476-A	Two-frequency; with PERMAKAY filter
PA-9138	Single-frequency; with Tuneable filter
PA-9267	Single-frequency; with PERMAKAY filter and local squelch
PA-9268	Single-frequency; with Tuneable filter and local squelch

*This model also available in the PA-9138 Series in which the K-9103 Tuneable Filter is used in place of the K-8436-A PERMAKAY Filter.

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4545 Augusta Blvd. Chicago 51, Illinois

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NOMINAL PERFORMANCE SPECIFICATIONS

Receivers with PERMAKAY Filter (60 kc. channel spacing)

BASIC UNIT	PA-8433-A PA-8476-A PA-9267
FREQUENCY	152-174 mc.
PRIMARY POWER SUPPLY	Separate power supply. 6.3 volt heater circuit.
20 DB. QUIETING SENSITIVITY	Less than 0.6 microvolts 50-72 ohms RF input impedance
SELECTIVITY	More than -100 db. at ±30 kc.
SPURIOUS RESPONSE	All spurious and image responses are attenuated at least 100 db.
TEMPERATURE RANGE AND FREQUENCY STABILITY	Using an oven type crystal unit the overall stability is maintained to within ±1 kc. of assigned center frequency or approximately ±.00006% over the ambient temperature range -30°C. to +60°C. (+25°C. reference).
SQUELCH	Noise compensated type, adjustable sensitivity. Threshold sensitivity of 0.2 microvolts (U.S. Patent No. 2343115).
AUDIO OUTPUT	1 watt to a 3 ohm speaker
TUBE COMPLEMENT AND FUNCTION	6AK5 - RF Amp. (1) 6AK5 - RF Amp. (2) (1) 6J6 - Osc. & Mult. (1-Freq.) or (2) 6J6 - Osc. & Mult. (2-Freq.) 6AK6 - 1st Mixer 6BH6 - 1st IF Amp. 6BH6 - 2nd Osc. 6BH6 - 2nd Mixer 6BH6 - 2nd IF Amp. (1) 6BH6 - 2nd IF Amp. (2) 6BH6 - 2nd IF Amp. (3) 6BH6 - 2nd IF Amp. (4) 6BH6 - 1st Limiter 6BJ6 - 2nd Limiter 6AL5 - Discriminator 6BH6 - Noise Amp. 6AL5 - Noise Rectifier 12AX7 or 12AT7 - 1st Audio & Squelch 6AQ5 - Audio Pwr. Amp.
NUMBER OF TUNED CIRCUITS	Total of 34: 5 rigid coaxial tuned lines in the antenna, RF amplifier and oscillator multiplier stages. 29 permeability tuned circuits in the oscillator and IF amplifier stages including 15 plastic-cast circuits in the PERMAKAY IF Filter.
FILTER TYPE	K-8436-A PERMAKAY
METERING	A single scale meter may be used with associated rotary selector switches and chassis mounted metering socket to measure all circuits essential to tuning and checking.
NOMINAL POWER INPUT	Operate: 45 watts Muted: 35 watts
DIMENSIONS	4-7/8" wide x 5-1/4" high x 16-1/2" long
WEIGHT	9 lbs.
MOUNTING	19" rack

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

NOMINAL PERFORMANCE SPECIFICATIONS

Receivers with TUNEABLE Filter (120 kc. channel spacing)

BASIC UNIT	PA-9138 Series and PA-9268
FREQUENCY	152-174 mc.
PRIMARY POWER SUPPLY	Separate power supply. 6.3 volt heater circuit.
20 DB QUIETING SENSITIVITY	Less than 0.65 microvolts 50-72 ohms RF input impedance
SELECTIVITY	More than -100 db. at ±120 kc. More than -50 db. at ±60 kc.
SPURIOUS RESPONSE	All spurious and image responses are attenuated at least 100 db.
TEMPERATURE RANGE AND FREQUENCY STABILITY	Using an oven type crystal unit the overall stability is maintained to within ±1 kc. of assigned center frequency or approximately ±.00006% over the ambient temperature range -30°C. to +60°C. (+25°C. reference).
SQUELCH	Noise compensated type, adjustable sensitivity. Threshold sensitivity of 0.2 microvolts (U.S. Patent No. 2343115).
AUDIO OUTPUT	1 watt to a 3 ohm speaker
TUBE COMPLEMENT AND FUNCTION	6AK5 - RF Amp. (1) 6AK5 - RF Amp. (2) 6J6 - Osc. & Mult. 6AK5 - 1st Mixer 6BH6 - 1st IF Amp. 6BH6 - 2nd Osc. 6BH6 - 2nd Mixer 6BH6 - 2nd IF Amp. (1) 6BH6 - 2nd IF Amp. (2) 6BH6 - 2nd IF Amp. (3) 6BH6 - 2nd IF Amp. (4) 6BH6 - 1st Limiter 6BJ6 - 2nd Limiter 6AL5 - Discriminator 6BH6 - Noise Amplifier 6AL5 - Noise Rectifier 12AX7 or 12AT7 - 1st Audio and Squelch 6AQ5 - Audio Pwr. Amp.
NUMBER OF TUNED CIRCUITS	Total of 21: 5 rigid coaxial tuned lines in the antenna, RF amplifier and oscillator multiplier stages; 16 permeability tuned circuits in the oscillator and IF amplifier stages, including 2 in the tuneable IF filter.
FILTER TYPE	K-9103 Tuneable Filter
METERING	A single scale meter may be used with associated rotary selector switches and chassis mounted meter socket to measure all circuits essential to tuning and checking.
NOMINAL POWER INPUT	Operate: 45 watts Muted: 35 watts
DIMENSIONS	4-7/8" wide x 5-1/4" high x 16-1/2" long
WEIGHT	9 lbs.
MOUNTING	19" rack

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

1. DESCRIPTION

a. Design

The new MOTOROLA "SENSICON" Receiver represents a progressive departure from conventional receiver design--a departure which was forced by the extreme technical requirements of adjacent channel operation. The stringent demands of close channel occupancy constitutes a challenge which is now successfully met by the amazing performance of this new communications receiver.

The PERMAKAY IF wave filter incorporated in the "SENSICON" receiver determines to a controlling degree the overall selectivity characteristics of the circuit. Permeability tuned coils and compensating capacitors comprise 15 tuned circuits which are permanently sealed, fixed electrically and mechanically by casting the entire filter structure in a solid block of polymerized resin. Thus, approximately 50% of the resonant circuits contributing to the IF selectivity of the new "SENSICON" unit are tuned at the factory and completely sealed in a solid casting of polyesterstyrene--rendered forever impervious to the effects of heat, humidity and vibration.

The "SENSICON" Receiver is available with the K-9103 Tuneable Filter for installation where stringent adjacent channel selectivity is not necessary.

The K-9103 Tuneable Filter contains two permeability tuned coils, which together with compensating capacitors, comprise two tuned capacity coupled circuits. A resistance is incorporated in the circuit to match insertion loss with the K-8436-A PERMAKAY Filter.

The K-8436-A PERMAKAY Filter and the K-9103 Tuneable Filter are mechanically interchangeable and may be interchanged when desired. Easy, economical transition to full adjacent channel operation can thereby be accomplished at any time.

b. Applications

The same basic "SENSICON" strip chassis is employed in all models, mobiles, locally controlled base stations and remotely controlled base stations. The receiver variation from model to model is simply in superficial mounting hardware.

The power supply is on a separate chassis, normally mounting adjacent to the transmitter unit. Adaptations required for the various AC or DC primary power sources take place on the power supply chassis.

2. CHASSIS COMPLEMENT

The PA-8433-A is a single-frequency "SENSICON" receiver designed to operate from a 117 VAC primary power source and is composed of:

P-8416	Basic Chassis (uses Type A04 or A12 IF Xtal.) includes K-8414 Coil Kit
K-8436-A	PERMAKAY Filter (-100 db. at ±30 kc.)
P-8403-A	RF Deck (uses Type D01 or D31 Control Xtal.)
K-8608	Chassis Mounting Kit

The PA-8476-A is a two-frequency "SENSICON" receiver designed to operate from a 117 VAC primary power source and is composed of:

P-8416	Basic Chassis (uses Type A04 IF Xtal.) includes K-8414 Coil Kit
K-8436-A	PERMAKAY Filter (-100 db. at ±30 kc.)
P-8404-A	RF Deck (uses Type E01 Control Xtal.)
K-8608	Chassis Mounting Kit
K-9141	Two-Frequency Conversion Kit

The PA-9138 "SENSICON" receiver is a single-frequency receiver designed for 120 kc. channel spacing operation. A K-9103 Tuneable Filter is used. This model consists of the following items:

P-8416-A	Basic Chassis (uses Type A04 IF Xtal.)
K-8414	Coil Kit
K-9103	Tuneable Filter
P-8403-A	RF Deck (uses Type D01 Control Xtal.)
K-8608	Chassis Mounting Kit

The PA-9267 is a single-frequency "SENSICON" receiver designed to operate from a 117 VAC primary power source and is composed of:

P-8416	Basic Chassis (uses Type A04 IF Xtal.) includes K-8414 Coil Kit
K-8436-A	PERMAKAY Filter (-100 db. at ±30 kc.

P-8403-A	RF Deck (uses Type D01 Control Xtal.)
K-8608	Chassis Mounting Kit
K-9144	Local Squelch Kit

The PA-9268 is a single-frequency "SENSICON" receiver designed to operate from a 117 VAC primary power source and is composed of:

P-8416-A	Basic Chassis (uses Type A04 IF Xtal.) includes K-8414 Coil Kit
K-9103	TUNEABLE Filter (-100 db. at ±120 kc.)
P-8403-A	RF Deck (uses Type D01 Control Xtal.)
K-8608	Chassis Mounting Kit
K-9144	Local Squelch Kit

P-8501-A TEST SET

3. ALIGNMENT NOTES

a. Test Equipment

(1) Portable Test Equipment

The MOTOROLA Portable Test Set described below is used to meter and align the "SENSICON" receiver, as outlined in both the field and laboratory test procedures of this text.

The MOTOROLA P-8501-A Test Set is designed and engineered for use with MOTOROLA "RESEARCH" Line equipment. Simplified meter switching, an expanded meter range, and two crystal sockets have made the P-8501-A Test Set a universal instrument for field testing and alignment of MOTOROLA receivers.

With the addition of a 455 kc. crystal (available for purchase by ordering Part Number 48A801065), the P-8501-A may be used to completely align a "SENSICON" receiver. Earlier models of the MOTOROLA Test Set may also be used for alignment of MOTOROLA "RESEARCH" Line equipment with only slight changes in alignment procedure.

(2) Laboratory Test Equipment

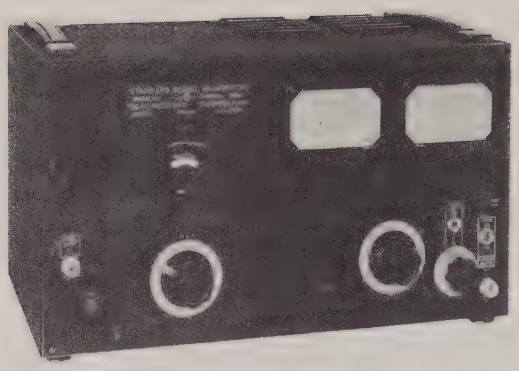
(a) One (1) Model 65B Measurements Corporation Signal Generator (75 kc. -30 mc.), or equivalent, with output leads and filter matching pad. This pad consists of a 5600 ohm resistor in series with the generator output lead. This generator may be used to adjust both high (5.5 mc.) and low (455 kc.) IF coils.

(b) One (1) Model 80 Measurements Corporation Signal Generator (2 mc. -400 mc.) or equivalent, is used to produce the carrier frequency (152-174 mc.).

When applying a test signal to the grid of a tube, a coaxial lead with a resistive termination should be used. A Measurements Corporation Coaxial Carrier Output Cable, Part No. 80-ZH4 (50 ohms impedance with 50 ohms termination) is most suitable for this purpose. When feeding a signal into a tuned circuit, use a coaxial lead with a 6 db. pad. A Measurements Corporation Coaxial Carrier Output Cable, Part Number 84-Z2-2 (50 ohms impedance) and an Output Matching Pad, Part No. 80-ZH3 (6 db. loss) should be used for this application.

(c) One (1) MOTOROLA Portable Test Set.

(d) One (1) db. output meter with clip leads (for sensitivity check only).



MODEL 80 SIGNAL GENERATOR

b. Pre-Operational Checks and Adjustments

This receiver was tuned and adjusted for its exact operating frequency prior to shipment from the factory. Unless it has been handled roughly while in transit, or otherwise abused or tampered with, it should require no further adjustment before placing it in service.

(1) Insure Proper Alignment to Transmitter

(a) Connect the portable test set to the receiver METER receptacle.

(b) Radiate a signal from a transmitter which the receiver is normally intended to receive.

(c) Check the discriminator balance against this frequency by placing the meter switch in position 4. Note the meter reading. If the reading is within ±1 microampere of zero, the alignment can be considered satisfactory. If not within ±1 microampere of zero, adjust TU6B for zero reading with meter switch in position 4. If two-frequency receiver, also adjust TU6C for second frequency discriminator zero meter reading.

(2) Laboratory Sensitivity Check

Quieting signal is that input signal necessary to reduce the output noise, at the speaker 20 db. This measurement is to be made in a well shielded location in the absence of extraneous noises.

This measurement is important, in that it indicates in one measurement that the signal to noise ratio of the RF stage is satisfactory and that there is sufficient gain, i.e., that amplifier tubes are working normally.

The actual measurement is made by observing the noise voltage at the speaker without any carrier at the antenna. Then sufficient carrier is introduced at the antenna to reduce the output voltage to 1/10 its former value.

To measure the quieting signal accurately, a Model 80 Signal Generator or equivalent and an electronic AF voltmeter or db. output meter and a MOTOROLA Portable Test Set are required.

The proper procedure is as follows:

(a) Turn the signal generator "on" and allow the signal to stabilize by a "warm-up" period of 1-1/2 to 2 hours.

(b) Connect the meter plug from the MOTOROLA Test Set to the METER receptacle on the chassis.

(c) Connect the signal generator, adjusted to the desired carrier frequency to the antenna input connector using the coaxial lead and 6 db. pad. The exact carrier frequency will be indicated by a zero reading on the test set meter with the meter switch in position 4.

(d) Connect the output meter across the voice coil leads.

(e) Turn the SQUELCH control fully counterclockwise (OFF).

(f) With no signal input to the receiver (ATTENUATOR control set for zero output) adjust the VOLUME control for 0.8 volts of noise output on the audio output meter.

(g) Adjust the output level of the signal generator until the receiver audio is decreased 20 db. (to 0.08 volts) from the reading in step (f).

(h) Note the setting of the signal generator output control. This value (microvolts) is the 20 db. quieting sensitivity of the receiver.

c. Alignment Methods

IT IS RECOMMENDED THAT THIS TEXT BE READ CAREFULLY BEFORE ATTEMPTING ANY ALIGNMENT ADJUSTMENTS.

Two detailed alignment procedures are provided in this text.

The first is a complete alignment using a

portable MOTOROLA P-8501-A Test Set. This procedure permits complete alignment of the "SENSICON" receiver in the field.

The second is a more comprehensive alignment for bench testing requiring the use of signal generators capable of producing 455 kc. (2nd IF) 5.5 mc. (1st IF) and 152-174 mc. (RF) signals.

NOTE

Fixed station receiver metering facilities are provided particularly for "in operation" circuit checking. Although cabinet meters will provide adequate metering of most receiver circuits, complete "in-place" alignment with the front panel instruments cannot readily be accomplished due to specific signal generator connection difficulties involved. Hence, reference will not be made to fixed station metering in the alignment procedures as outlined in this section.

Following the bench test alignment are general instructions for Gain Control Adjustment, Touch Up Alignment for Two-Frequency Receivers, Multiple Receiver Alignment and complete Stage Measurements.

The usual practice of using a voltmeter across the voice coil of an AM receiver to indicate gains and resonance will not be of value in aligning an FM receiver. The output at the speaker depends on frequency swing and not on amplification of the carrier beyond that necessary to saturate the limiters.

Alignment and gain measurements are made on FM receivers by observing with a high resistance voltmeter or series compensated microammeter, the voltage or current, developed by grid rectification in the various IF and limiter stages. Adjustment of the various tunable elements is made to bring these readings to their optimum value. Stage gains can be measured by selecting an appropriate reference level, applying it to the stage under measurement, and comparing input level to output level.

4. ALIGNMENT PROCEDURE USING A MOTOROLA PORTABLE TEST SET

a. MOTOROLA Portable Test Set Switch Positions

Switch positions on the MOTOROLA P-8501-A Test Set and the corresponding circuits being checked are:

METERING SWITCH POSITION	CIRCUIT
1	2nd IF-4 Grid
2	1st Limiter Grid
3	2nd Limiter Grid
* +4, -4	Discriminator Output (Balance)
5	Discriminator Input
6	1st Oscillator Grid
7	No Connection
8	Audio Output Transformer

*The P-8501-A Test Set has a +4 and a -4 position on the selector switch to permit an "up scale" reading for discriminator balance adjustment.

b. Alignment of Discriminator and Second IF Coils

(1) Portable Test Meter Adjustments

(a) Plug the 455 kc. crystal into the crystal socket.

(b) Set the GRID CURRENT-METER-FIELD STRENGTH switch in the GRID CURRENT position.

(c) Place the ON-OFF switch in the ON position.

(d) Set the ATTENUATOR control for maximum output.

(e) Adjust the frequency ADJ control for maximum meter reading.

(f) Connect the RF probe to the RF OUTPUT receptacle with the extension cable supplied.

(g) Lay the probe under the receiver chassis near tube V 304.

(h) Place the REC-XMTR-0-50 ua switch in the REC. position and the GRID CURRENT-METER-FIELD STRENGTH switch in the METER POSITION. Plug the 11 pin connector from the test set into the METER receptacle (J 301, female) on the "SENSICON" receiver chassis.

(i) Place the selector switch in position 4.

(j) The receiver Discriminator and IF coils may now be peaked as outlined.

(2) Adjustments, Discriminator and Second IF Coils

(a) Adjust Discriminator secondary coil 978 for zero meter reading with meter switch in position 4.

(b) Adjust Discriminator primary coil 312 for maximum meter reading with meter switch in position 5.

(c) Readjust Discriminator secondary coil 978 for zero meter reading with meter switch in position 4.

(d) Readjust Discriminator primary coil 312 for maximum meter reading with meter switch in position 5. Recheck for zero meter reading in position 4.

(e) Adjust limiter coil 311 for maximum meter reading with meter switch in position 3.

(f) Adjust 2nd IF-4 amplifier coil 310 for maximum meter reading with meter switch in position 2.

(g) Adjust 2nd IF-3 amplifier coil 309 for maximum meter reading with meter switch in position 1.

(h) Reduce the output of the test set peaking generator (use ATTENUATOR control) for an unsaturated meter reading with meter switch in position 1. A meter reading of 10 to 15 is sure to be an unsaturated reading.

(i) Adjust the 2nd IF-2 amplifier coil 308 for maximum meter reading, reducing output of peaking generator to keep the meter reading below 15 with meter switch in position 1.

NOTE

The ATTENUATOR may reduce the peaking generator output sufficiently to cause the oscillations to cease. If this occurs, place the GRID CURRENT-METER-FIELD STRENGTH in the GRID CURRENT position and decrease the attenuation until the meter indicates oscillation. Return the P-8501-A switch to the METER position. The signal to the receiver may now be further reduced by increasing the distance between the RF probe and the receiver chassis.

(j) Adjust the 2nd IF-1 amplifier coil 307 for maximum meter reading with meter switch in position 1, reducing the output of the signal generator to keep the meter reading below 15.

NOTE

If a K-9103 Tuneable Filter is used in place of a PERMAKAY Filter, adjust coils F 1 and F 2 for maximum meter reading with meter switch in position 1.

(k) Upon completion of the above adjustments, turn the peaking generator "off". Remove the probe from beneath the chassis.

c. Adjustment, First Oscillator Coil

(1) Place the selector switch in position 6. A meter reading indicates receiver 1st oscillator activity. If there is no reading, adjust TU6B until the meter indicates oscillations.

NOTE

If all crystal frequencies are correct, the proper adjustment of coil TU6B will be between 2 and 5 microamperes lower than the peak reading. The correct frequency adjustment is in the counterclockwise direction from the maximum meter reading (adjusted from wiring side of chassis).

(2) Place the desired carrier frequency "on the air" using the associated transmitter which the receiver is normally intended to receive.

(3) Place the selector switch in position 4 (Discriminator).

(4) Adjust TU6B for zero meter reading.

NOTE

Inability to obtain an indication of receiver quieting in the presence of an on-channel RF signal is evidence that the IF and/or RF stages are noticeably detuned or that one or more tubes are defective.

In this event, peak the 1st IF coils using the desired transmitter signal and positions 1 or 2 on the test meter. Pro-

ceed to align the 1st Oscillator coil as outlined.

Approximate alignment of a replacement coil may be achieved by setting the slug at the same height as the slug in a previously tuned coil.

(5) For two-frequency receivers, transmit the second carrier frequency and adjust TU6C for zero meter reading with the control head F 1, F 2 switch in the F 2 position.

d. Adjustments, 1st IF Coils

(1) Place the transmitter crystal for the associated carrier frequency or its equivalent into the crystal socket on the test set.

The P-8501-A Test Set contains a 6-12 switch which places a dropping resistor in series with the crystal heater when in position 12. The use of this switch depends upon the power source of the receiver being aligned and the voltage rating of the crystal heater. The proper setting for the switch is indicated below.

(a) Position 6, when aligning a 6 VDC receiver with a six volt crystal heater.

(b) Position 12, when aligning a 12 VDC receiver with a six volt crystal heater.

(c) Position 6, when aligning a 12 VDC receiver with a twelve volt crystal heater.

(2) Connect the output of the peaking generator, RF OUT, to the ANT connector of the Antenna Relay on the transmitter chassis using the cable supplied with the test set.

A ground connection must be made between the test set and the receiver being aligned to permit operation of the test sets crystal heater. The shield of the RF cable is used for this purpose.

(3) Turn the peaking generator "on" with the ON-OFF switch on the test set.

(4) Place the meter switch in the GRID CURRENT position and set the ATTENUATOR in the maximum output position. Check the meter for oscillator grid current. The meter reading is a relative indication of crystal activity.

(5) Return the meter switch to the METER position and place the selector switch in position 2. Tune the output of the peaking generator for a maximum meter reading by adjusting the control marked OSC TUNE as follows:

(a) Set the ATTENUATOR control to maximum. Adjust the OSC TUNE control for a maximum meter reading on the test set with the meter switch in position 2. Check for the correct frequency by placing the meter switch in position 4. Adjust the OSC TUNE control to obtain a stable reading in position 4 and a maximum meter reading in position 2.

NOTE

If a meter peak cannot be found, move the ATTENUATOR to its mid-position and adjust the OSC TUNE control again.

(b) Place the selector switch in position 4. Adjust the test set crystal frequency for zero discriminator meter reading with the control capacitor marked ADJ on the test meter.

(c) After obtaining a maximum reading in position 2, reduce the ATTENUATOR level and repeak the meter with the OSC TUNE control. Do not set the ATTENUATOR level so low that the oscillations stop as indicated by zero reading on the meter when the meter switch is placed in the GRID CURRENT position.

(6) Place the selector switch in position 1 or 2 (position 2 is more sensitive but saturates for lower signal levels). Keep the oscillator output level less than a reading of 10-15 in position 1.

CAUTION

Care should be taken when reducing the output of the peaking generator as the ATTENUATOR is not linear; however, it will provide good control at low output levels and attenuate to zero output.

(7) Place selector switch in position 2. Adjust the 1st IF coils 306B, 305B, 304B, 303B, 302B, and 301B for a maximum meter reading.

CAUTION

When adjusting IF coil 305B, two definite peaks will be observed on the test meter. Care should be taken not to tune the coil to the 2nd oscillator frequency (smallest peak). Tune for a maximum meter indication of the larger peak.

(8) Upon completion of the 1st IF coil adjustments, maintain the peaking generator con-

nection and test set switch settings for alignment of the RF circuits.

e. Adjustments, RF Circuits

(1) If the test set has not been used to align the 1st IF coils, prepare the test set for RF alignment as outlined in steps d(1) through d(6) above (selector switch in position 2).

(2) Remove the screw caps from the RF tuning pipes.

(3) Adjust the tuning pipes TU5, TU4, TU3, TU2, and TU1 for maximum meter reading.

(4) Replace caps on RF tuning pipes and thread gently with fingers.

CAUTION

The gaskets will set if compressed too tightly; therefore do not tighten, merely thread caps on to keep out dirt and moisture.

NOTE

When aligning a two-frequency receiver there are several distinct possibilities to be considered. Normally, the receiver is aligned to the primary frequency (most-used frequency) and the secondary frequency is within ±120 kc. of the primary frequency. In this case the receiver operates on either frequency within the nominal performance specifications listed in this instruction manual. When the two frequencies are approximately equal in importance it is advisable to align the receiver to the lower of the two frequencies. Again, the operation is within nominal performance specifications as long as the frequency separation is 120 kc. or less. When the two desired operating frequencies are greater than 120 kc. apart, it is advisable to align the RF circuits at the frequency equidistant between the operating frequencies. If both operating frequencies are within ±120 kc. of RF circuit resonance the receiver will operate within the stated nominal performance specifications. This type of alignment, however, is more complex and requires an additional crystal for alignment purposes and a signal generator for the alignment frequency.

5. COMPREHENSIVE ALIGNMENT PROCEDURE FOR LABORATORY BENCH TESTING

TYPICAL BENCH TEST

a. Interconnection of Equipment

(1) Refer to page 5 for test equipment required.

(2) Connect the portable test set to the receiver METER receptacle.

(3) Connect the db. output meter clip leads across the voice coil (pins 6 & 7 on control receptacle P 303 or any other convenient connection point on the unit).

(4) Using the coaxial cable with resistive termination and a 5600 ohm series resistor, connect the signal generator (Model 65B or equivalent) to the input receptacle (P 301) of the PERMAKAY Filter Unit.

NOTE

When aligning a PA-9268 or PA-9138 series "SENSICON" receiver, connect the signal generator to the input receptacle of the K-9103 Tuneable Filter.

b. Adjustments, Discriminator and Second IF Coils

(1) Set the signal generator (Model 65B or equivalent) attenuator for maximum output at 455 kc.

(2) Adjust Discriminator secondary coil

978 to zero meter reading with meter switch in position 4.

(3) Adjust Discriminator primary coil 312 for maximum meter reading with meter switch in position 5.

(4) Readjust Discriminator secondary coil 978 for zero meter reading with meter switch in position 4.

(5) Readjust Discriminator primary coil 312 for maximum meter reading with meter switch in position 5.

(6) Adjust limiter coil 311 for maximum meter reading with meter switch in position 3.

(7) Adjust 2nd IF-4 amplifier coil 310 for maximum meter reading with meter switch in position 2.

(8) Adjust 2nd IF-3 amplifier coil 309 for maximum meter reading with meter switch in position 1.

(9) Reduce the output of the signal generator for an unsaturated meter reading with meter switch in position 1. A meter reading of 10 to 15 is sure to be an unsaturated reading.

(10) Adjust the 2nd IF-2 amplifier coil 308 for maximum meter reading, reducing output of signal generator to keep the meter reading below 15 with meter switch in position 1.

(11) Adjust the 2nd IF-1 amplifier coil 307 for maximum meter reading with meter switch in position 1, reducing the output of the signal generator to keep the meter reading below 15.

NOTE

If a K-9103 Tuneable Filter is used in place of a PERMAKAY Filter, adjust coils F 1 and F 2 for maximum meter reading with meter switch in position 1.

(12) Disconnect signal generator. Reconnect filter cable to filter.

c. Adjustments, First IF Coils

(1) Connect the output of a signal generator (Model 65B, 80 or equivalent), adjusted to 5.5 megacycles, to the grid of V 301 (pin 1) 1st IF stage, using the coaxial cable with a resistive termination. Adjust generator for zero discriminator reading (position 4).

(2) Adjust IF coils 306B, 305B, and 304B for a maximum meter reading with the meter switch in position 1 or 2 (position 2 being more sensitive). Keep the signal generator output level less than a reading of 10 - 15 on the test meter.

CAUTION

When adjusting IF coil 306B, two definite peaks will be observed on the test meter. Care should be taken not to tune the coil to the 2nd oscillator frequency (smaller peak). Tune for a maximum meter indication of the larger peak.

(3) Connect the output of the signal generator (5.5 mc.) to the grid of V 103 (pin 1) 1st Mixer stage.

(4) Adjust IF coils 303B, 302B, and 301B for a maximum meter reading with meter switch in position 1 or 2 (position 2 being more sensitive).

(5) Repeak IF coils 306B, 305B, 304B, 302B, and 301B.

(6) Disconnect the signal generator.

d. Adjustment, First Oscillator Coil

(1) Place the selector switch in position 6. A meter reading indicates receiver 1st oscillator activity. If there is no reading, adjust TU6B until the meter indicates oscillation.

NOTE

If all crystal frequencies are correct, the proper adjustment of coil TU6B will be between 2 and 5 microamperes lower than the peak reading. The correct frequency adjustment is in the counterclockwise direction from the maximum meter reading (adjusted from wiring side of chassis).

(2) Place the desired carrier frequency "on the air" using the signal from a transmitter whose carrier frequency is the desired receiver frequency.

(3) Place the selector switch in position 4 (discriminator).

(4) Adjust TU6B for zero meter reading.

NOTE

Inability to obtain an indication of receiver quieting in the presence of an on-channel RF signal is evidence that the

IF and/or RF stages are noticeably detuned or that one or more tubes are defective. In this event, peak the 1st IF coils using the desired transmitter signal and positions 1 or 2 on the test meter. Proceed to align the 1st Oscillator coil as outlined.

Approximate alignment of a replacement coil may be achieved by setting the slug at the same height as the slug in a previously tuned coil.

(5) For two-frequency receivers, transmit the second carrier frequency and adjust TU6C for zero meter reading with the control console F 1 - F 2 switch in the F 2 position.

e. Adjustments, RF Circuits

(1) Connect the output of the signal generator, adjusted to the desired carrier frequency, to the grid (pin 1) of V 102 2nd RF stage, using the coaxial lead and 6 db. pad.

(2) Remove the screw caps from the RF tuners.

(3) Adjust tuning pipes TU 5 and TU 4 for a maximum meter reading with meter switch in position 2.

(4) Connect the output of the signal generator, adjusted to the desired carrier frequency, to the antenna connector (J 101) on the receiver chassis.

(5) Adjust tuning pipes TU 3, TU 2, and TU 1 for a maximum meter reading with meter switch in position 2.

NOTE

If at any time during alignment, best quieting does not match the point of maximum gain as indicated by maximum position 2 reading, turn down GAIN control R 304. This retards the action of the automatic gain control circuit.

(6) Repeak TU 5, TU 4, TU 3, TU 2, and TU 1.

(7) Replace caps on RF tuning pipes and thread gently with fingers.

CAUTION

The gasket will set if compressed too tightely; therefore, do not tighten, merely thread caps on to keep out dirt and moisture.

NOTE

When aligning a two-frequency receiver there are several distinct possibilities to be considered. Normally, the receiver is aligned to the primary frequency (most-used frequency) and the secondary frequency is within ±120 kc. of the primary frequency. In this case the receiver operates on either frequency within the nominal performance specifications listed in this instruction manual. When the two frequencies are approximately equal in importance it is advisable to align the receiver to the lower of the two frequencies. Again, the operation is within nominal performance specifications as long as the frequency separation is 120 kc. or less. When the two desired operating frequencies are greater than 120 kc. apart, it is advisable to align the RF circuits at the frequency equidistant between the operating frequencies. If both operating frequencies are within ±120 kc. of RF circuit resonance the receiver will operate within the stated nominal performance specifications. This type of alignment, however, is more complex and requires an additional crystal for alignment purposes and a signal generator for the alignment frequency.

6. MULTIPLE RECEIVER ALIGNMENT

Base station models identified by the nomenclature FSTRU-2---(--)1-A include two receivers, each of which employs a D01 control and an A04 IF Crystal and is aligned on the frequencies specified in the preceding paragraphs.

In specific applications where the two-receivers are intended to receive carrier frequencies separated less than 500 kc. apart or separated 5.0 to 6.0 mc. apart, a D31 Control and an A12 IF Crystal are employed in the #2 receiver. The #1 receiver will retain a D01 and an A04 Crystal and will be aligned on standard frequencies. The #2 receiver modification is incorporated to effect a difference in the 1st IF frequencies of the two receivers in order to prevent interaction between the two units. Two-receiver base station models incorporating this shift of #2 receiver IF frequency, are identified by the nomenclature, FSTRU-2---(--)2-A.

Alignment of the modified #2 receiver is identical to the standard alignment as described in preceeding paragraphs of this section, except for differences in the 1st IF, Control Crystal and IF Crystal frequencies. Non-standard frequencies must be taken into consideration when aligning the receiver, replacing a crystal, replacing a receiver or changing the carrier frequency. Particular crystal and IF frequency data for a modified # 2 receiver may be determined by one of the following methods. The method to be applied will be dependent upon the selected carrier frequencies to which the receivers are to be tuned.

a. Less Than 500 Kc. Separation Between Receiver Carrier Frequencies

Two receivers which are to be used with frequency separations of less than 500 kc. are equipped with receiver control crystals of the same fundamental frequency. With employment of these control crystals, the first IF's of the two receivers will differ by the same amount that the received carrier frequencies differ. Hence frequency resonance of the first IF stages on the #2 receiver is shifted accordingly. This IF variation necessitates an equal shift of IF crystal frequency on the #2 receiver to attain a standard 455 kc. second IF. The #2 receiver is the one subject to modification.

A D31 Control Crystal and an A12 IF Crystal are employed on the #2 receiver to facilitate this modification. The D31 Crystal is of the same fundamental frequency as the D01 Crystal of the #1 receiver. The A12 Crystal frequency will vary depending upon which receiver is of the higher frequency. The A12 frequency may be calculated in this manner.

The operating frequencies of both receivers should be compared, and the difference in KC noted. If the #2 receiver is operating at a higher frequency than the #1 receiver, ADD the operating frequency difference to 5955 KC to establish the frequency of the A12 IF Crystal of the #2 receiver. If the #2 receiver is operating at a lower frequency than the #1 receiver, SUBTRACT operating frequency difference from 5955 KC to establish the frequency of the A12 IF Crystal of the #2 receiver.

b. 5.0 to 5.5 Mc. Separation Between Receiver Operating Frequencies

When the operating frequency of the #1 and #2 receiver are separated by 5.0 to 5.5 mc. The D31 Crystal frequency of the #2 receiver is obtained by application of the following formula:

$$f_o = \frac{f_c - 6.0}{5}$$

The A12 Crystal is specified at 6455 KC for this application. The 1st IF stages are aligned to 6.0 mc.

c. 5.5 to 6.0 Mc. Separation Between Receiver Operating Frequencies

When the operating frequency of the #1 and #2 receiver are separated by 5.5 to 6.0 mc. The D31 Crystal frequency of the #2 receiver is obtained by application of the following formula:

$$f_o = \frac{f_c - 5.0}{5}$$

The A12 Crystal is specified at 5455 KC for this application. The 1st IF stages are aligned to 5.0 mc.

IMPORTANT

When ordering replacement crystals for the #2 receiver, be sure to specify all frequencies involved and crystal type numbers.

7. MISCELLANEOUS ADJUSTMENTS

a. Gain Control Adjustment

With 0.6 microvolts signal input to the receiver and the SQUELCH control open (unsquelched), adjust the Gain Control R 304 (located on the side of the second mixer and local oscillator shield accessible from the bottom of the chassis) for best "on frequency" noise quieting.

b. Touch-Up Alignment For Two-Freqency Receiver

If the frequency separation is greater than ±240 kc. from circuit resonance, touch-up the RF tuners for equal sensitivity on both frequencies; that is, peak the RF circuits to a frequency equidistant from the two operating frequencies.

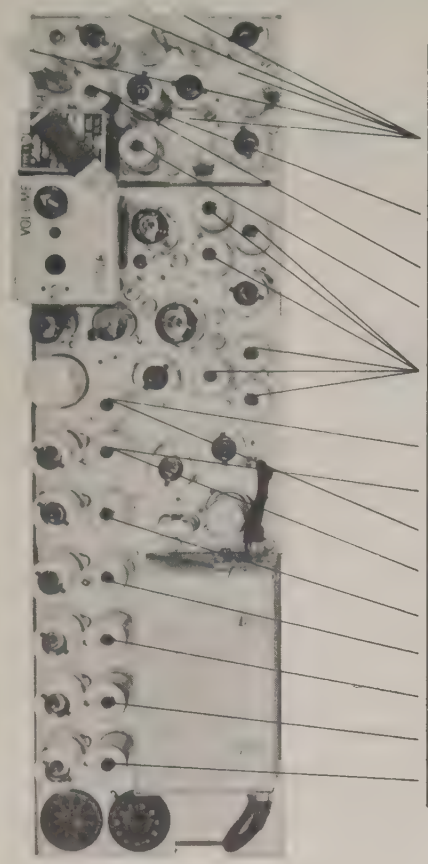
c. Stage Measurements

APPROXIMATE MICROVOLT INPUT		INPUT TO	FREQUENCY IN MC	METER POSITION	METER READING-TEST SET OR DB METER	
Filter Used					Filter Used	
PERMAKAY	TUNABLE				PERMAKAY	TUNABLE
Noise	Noise	Antenna	-	1	0 to -5	0 to -5
Noise	Noise	Antenna	-	2	-11 to -30	-11 to -30
Noise	Noise	Antenna	-	3	-32 to -50	-32 to -50
Noise	Noise	Antenna	-	4	0 to ±2	0 to ±2
Noise	Noise	Antenna	-	5	-17 to -24	-17 to -28
Noise	Noise	Antenna	-	6	-13 to -30	-13 to -30
0.50 0.55	0.50 1.2	Antenna	F_c	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
2.0 3.5	2.5 5.0	Pin 1 V 101	F_c	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
5.0 22.	20. 70.	Pin 1 V 102	F_c	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
5.0 60.	8. 25.	Pin 1 V 103	5.5	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
8.5 55.	4. 14.	Pin 1 V 301	5.5	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
**30 to 50 320	25. 200.	Filter Input thru 5600 ohm matching resistor	.455	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
3.20 52.	2.5 40.	Pin 1 V 304	.455	*DB Meter 1	20 db. (quieting) -5	20 db. (quieting) -5
2200	1800	Pin 1 V 305	.455	1	-5	-5
110,000	110,000	Pin 1 V 306	.455	1	-5	-5
18,000	11,000	Pin 1 V 307	.455	3	-25	-25
260,000	200,000	Pin 1 V 308	.455	3	-10	-10

*Refer to Laboratory Sensitivity Check procedure on page 6 when making this measurement.
**This test will serve as the PERMAKAY Filter Check.

8. SIMPLIFIED ALIGNMENT PROCEDURE

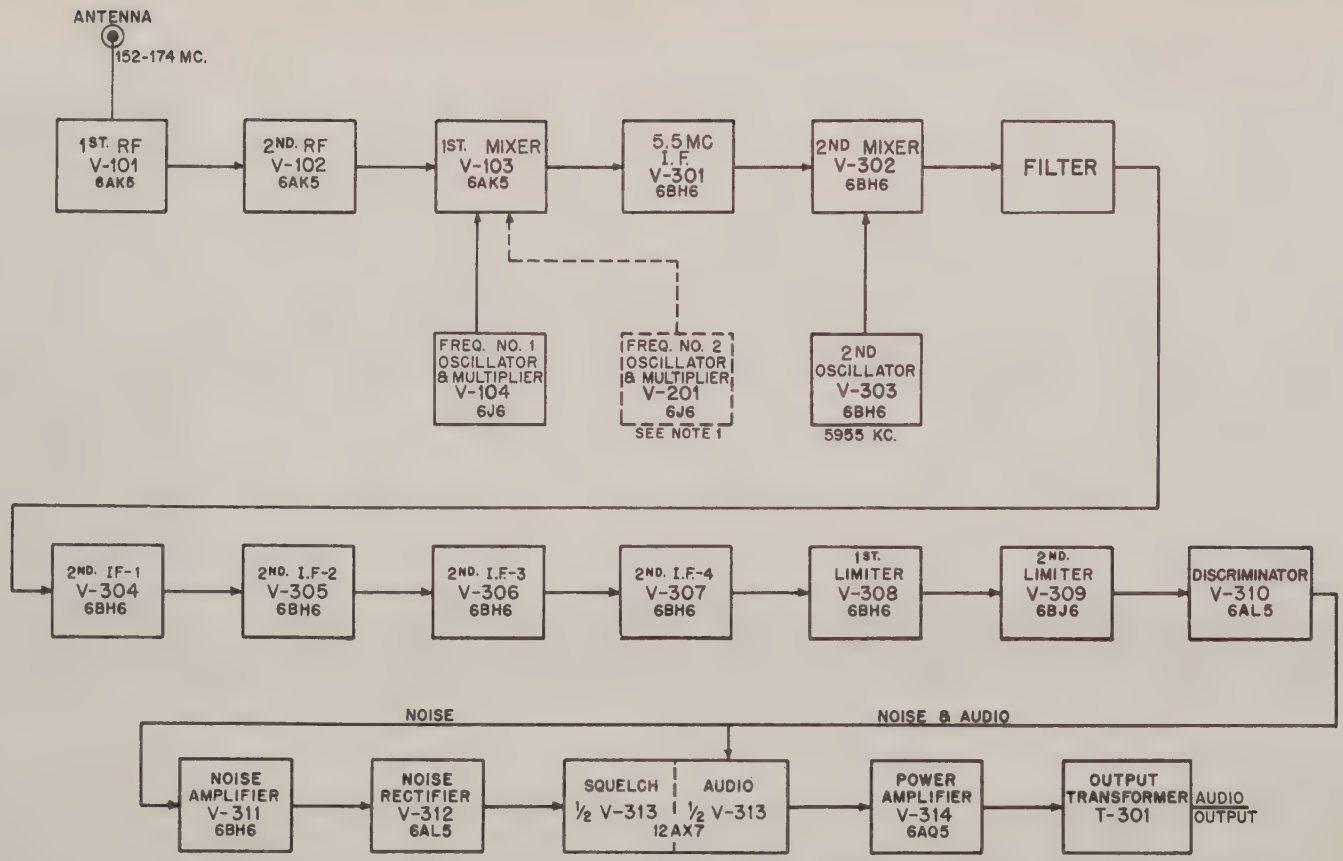
After the serviceman becomes familiar with the alignment of this unit he may use the Simplified Alignment Procedure as a check list. He should not attempt to use the check list until he has followed the complete alignment procedure using the P-8501-A Portable Test Set detailed earlier in this section.



SEQUENCE	METER POSITION	ADJUSTMENT	METER READING	STAGE AND PROCEDURE
Step 14	2	Pipes TU 5, TU 4, TU 3, TU 2, TU 1	Maximum	RF stages. Test Set must be tuned before making these adjustments. Adjust pipes in order listed. Replace caps when finished.
Step 10	6	Coil TU 6B	2-5 ua. less than max.	1st oscillator. Adjust for 2-5 ua. less than max. in CCW direction (adjusted from wiring side of chassis).
Step 11	4	Coil TU 6B	0	1st oscillator coil.
Step 12	4	Coil TU 6C	0	1st oscillator coil. (Frequency #2 of 2-frequency receiver.)
Step 13	2	Coils 306B, 305B, 304B, 303B, 302B, 301B	Maximum	1st IF coils. Test Set must be tuned before making these adjustments. Care must be taken to tune 306 to larger peak.
Step 1	4	Coil 978	0	Discriminator secondary. Probe near tube V 304 Steps 1-9.
Step 2	5	Coil 312	Maximum	Discriminator primary.
Step 3	4	Coil 978	0	Repeat Step 1.
Step 4	5	Coil 312	Maximum	Repeat Step 2.
Step 5	3	Coil 311	Maximum	Limiter Coil.
Step 6	2	Coil 310	Maximum	2nd IF-4.
Step 7	1	Coil 309	Maximum	2nd IF-3.
Step 8	1	Coil 308	Maximum	2nd IF-2, reduce output of Test Set.
Step 9	1	Coil 307	Maximum	2nd IF-1.

MOTOROLA
PART NO. 63C802281
ISSUE - E 10/54-CP

152-174 MC. "SENSICON" RECEIVER CHASSIS BLOCK DIAGRAM

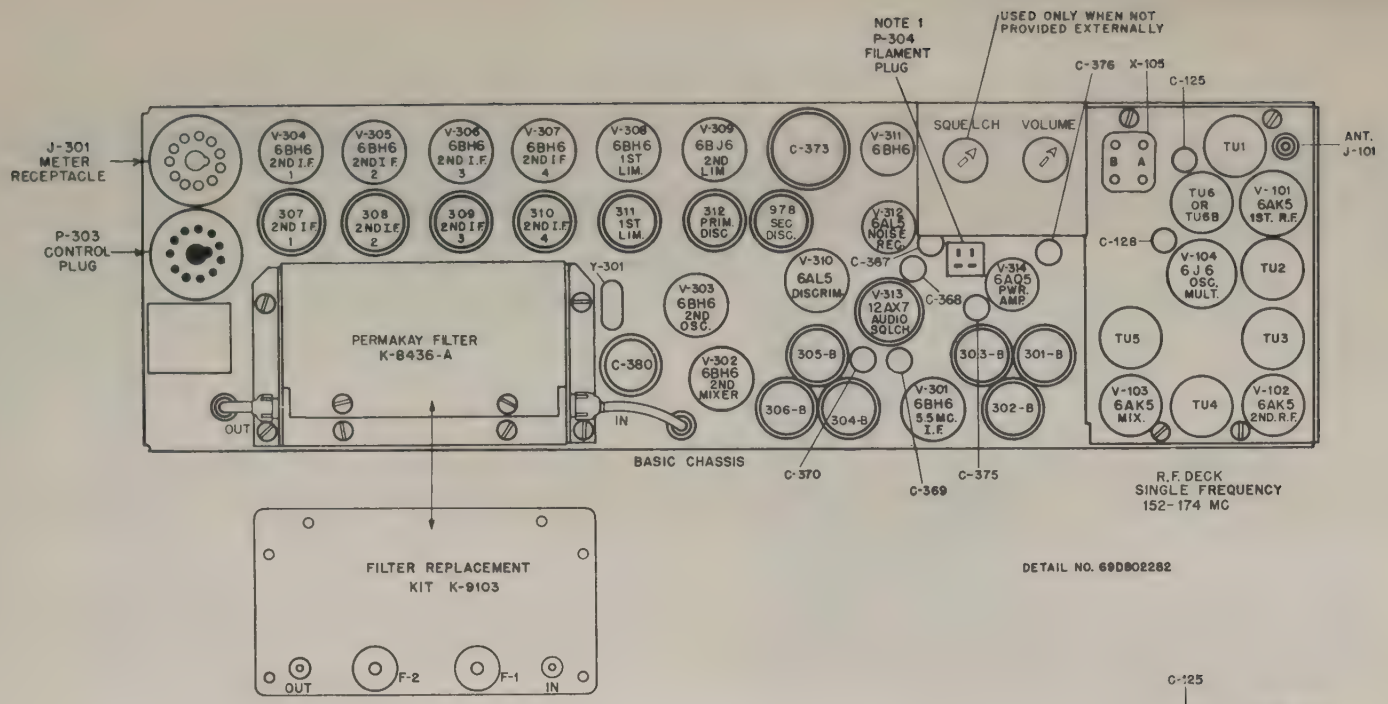


NOTES:
1. V-201 IS USED FOR TWO FREQUENCY OPERATION. ONLY ONE FREQUENCY MAY BE IN USE AT ONE TIME.
   $F_{XTAL} = \frac{F_{CARRIER} - 5.5\ MC}{5}$
   2ND. INT. FREQ. = 455 KC.
2. THE #2 RECEIVER OF (--)2-A BASE STATION 2-RECEIVER MODELS REQUIRE UNIQUE CALCULATIONS. REFER TO MULTIPLE RECEIVER ALIGNMENT.

MODEL DESCRIPTION - SENSICON RECEIVER

MODEL	CHANNELS	PRIMARY VOLTAGE	FILTER TYPE
PA-8433-A	1 FREQ.	6 V. D.C. OR 117 V. A.C.	K-8436-A
PA-8476-A	2 FREQ.	6 V. D.C. OR 117 V. A.C.	K-8436-A
PA-8476-A-12 V.	2 FREQ.	12 V. D.C.	K-8436-A
PA-8438-A	1 FREQ.	12 V. D.C.	K-8436-A
PA-9138	1 FREQ.	6 V. D.C. OR 117 V. A.C.	K-9103
PA-9267	1 FREQ.	6 V. D.C. OR 117 V. A.C.	K-8436-A
PA-9268	1 FREQ.	6 VDC OR 117 VAC	K-9103
WE-9267	1 FREQ.	6 VDC OR 117 VAC	K-8436-A
PA-7265-A	1 FREQ.	6 OR 12 VDC., 117 V. A.C.	K-8436-A
PA-7251-A	2 FREQ.	" " " "	K-8436-A
PA-7265-B	1 FREQ.	6VDC, 12VDC, 117 VAC	K-8436-A
PA-7251-B	2 FREQ.	6VDC, 12VDC, 117 VAC	K-8436-A

OBSOLETE AS OF 2/6/52



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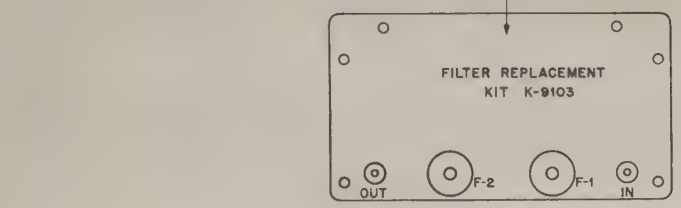
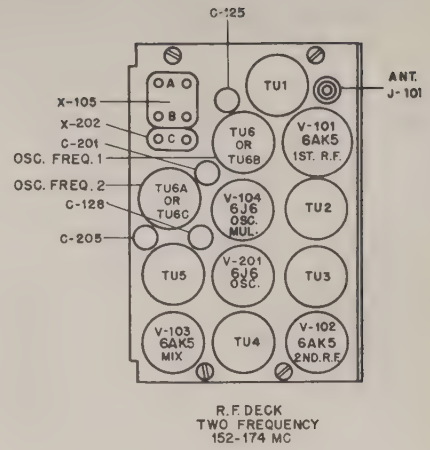




R.F. DECK
TWO FREQUENCY
152-174 MC

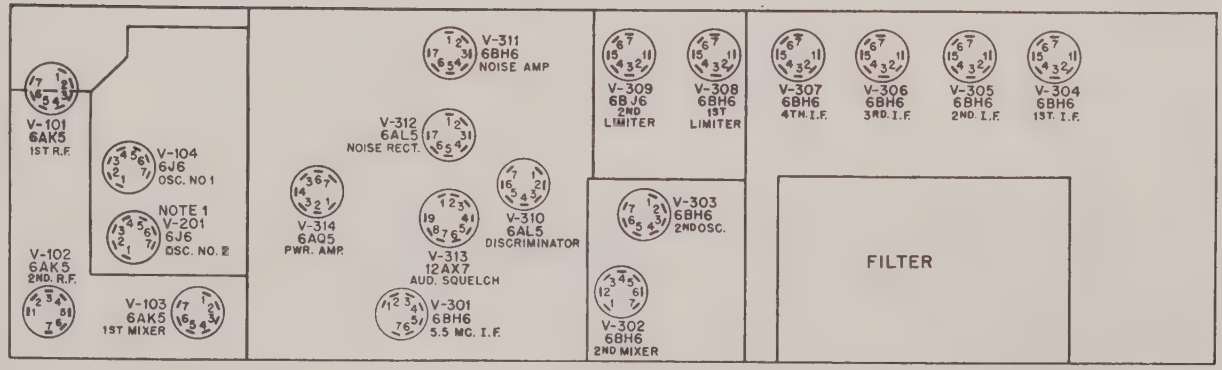
NOTE:
1. P-304 FILAMENT POWER PLUG INCLUDED ON PA-7265 SERIES AND PA-7251 SERIES ONLY.

MOTOROLA
PART NO. 69D802282
ISSUE - J 10/54-CP

152-174 MC. "SENSICON" RECEIVER CHASSIS
PARTS LOCATION DETAIL

MOTOROLA
PART NO. 63D802283
ISSUE - J 10/54-CP

152-174 MC. "SENSICON" RECEIVER CHASSIS
VOLTAGE AND RESISTANCE DIAGRAM



VOLTAGE

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
1ST R.F.	V-101	-.35	0	FIL.	FIL.	+140	+82	0	–	–
2ND. R.F.	V-102	0	+2.1	FIL.	FIL.	+140	+79	+2.1	–	–
1ST. MIXER	V-103	0	+2.3	FIL.	FIL.	+170	+79	+2.3	–	–
OSCILLATOR NO.1	V-104	72	84	FIL.	FIL.	-30	-4.6	+1	–	–
5.5 MC I.F.	V-301	0	0-+1	FIL.	FIL.	+152	+42	0+1	–	–
2ND MIXER	V-302	0	+3.5	FIL.	FIL.	+160	+115	0	–	–
2ND OSCILLATOR	V-303	-11	0	FIL.	FIL.	+45	+45	+45	–	–
1ST I.F.	V-304	0	0	FIL.	FIL.	+145	+64	0	–	–
2ND I.F.	V-305	0	+.53	FIL.	FIL.	+155	+51	0	–	–
3RD I.F.	V-306	0	+.8	FIL.	FIL.	+100	+76	0	–	–
4TH I.F.	V-307	0 -6	0	FIL.	FIL.	+78	+59	0	–	–
1ST LIMITER	V-308	-30	0	FIL.	FIL.	+90	+69	0	–	–
2ND LIMITER	V-309	-44	0	FIL.	FIL.	+125	+52	0	–	–
DISCRIMINATOR	V-310	0	-48	FIL.	FIL.	-1.2	+34	-44	–	–
NOISE AMPLIFIER	V-311	-6	+24	FIL.	FIL.	+167	+170	0	–	–
NOISE AMPLIFIER*	V-311	0	0	FIL.	FIL.	+54	+135	0	–	–
NOISE RECTIFIER	V-312	-21	-21	FIL.	FIL.	-20	+.3	-24	–	–
NOISE RECTIFIER*	V-312	-4	-4	FIL.	FIL.	+10	0	-30	–	–
AUDIO SQUELCH	V-313	+150	+30	+40	FIL.	FIL.	+32	-20	0	FIL.
AUDIO SQUELCH *	V-313	+180	+14	+32	FIL.	FIL	+14	-.5	0	FIL.
POWER AMPLIFIER	V-314	0	+10.5	FIL.	FIL.	+169	+178	0	–	–
OSCILLATOR NO. 2	V-201	72	84	FIL.	FIL.	-30	-4.6	+1	–	–

NOTE 1

*SQUELCHED
‡ VOLTAGE WHEN OSCILLATOR NO. 2 IS IN OPERATION

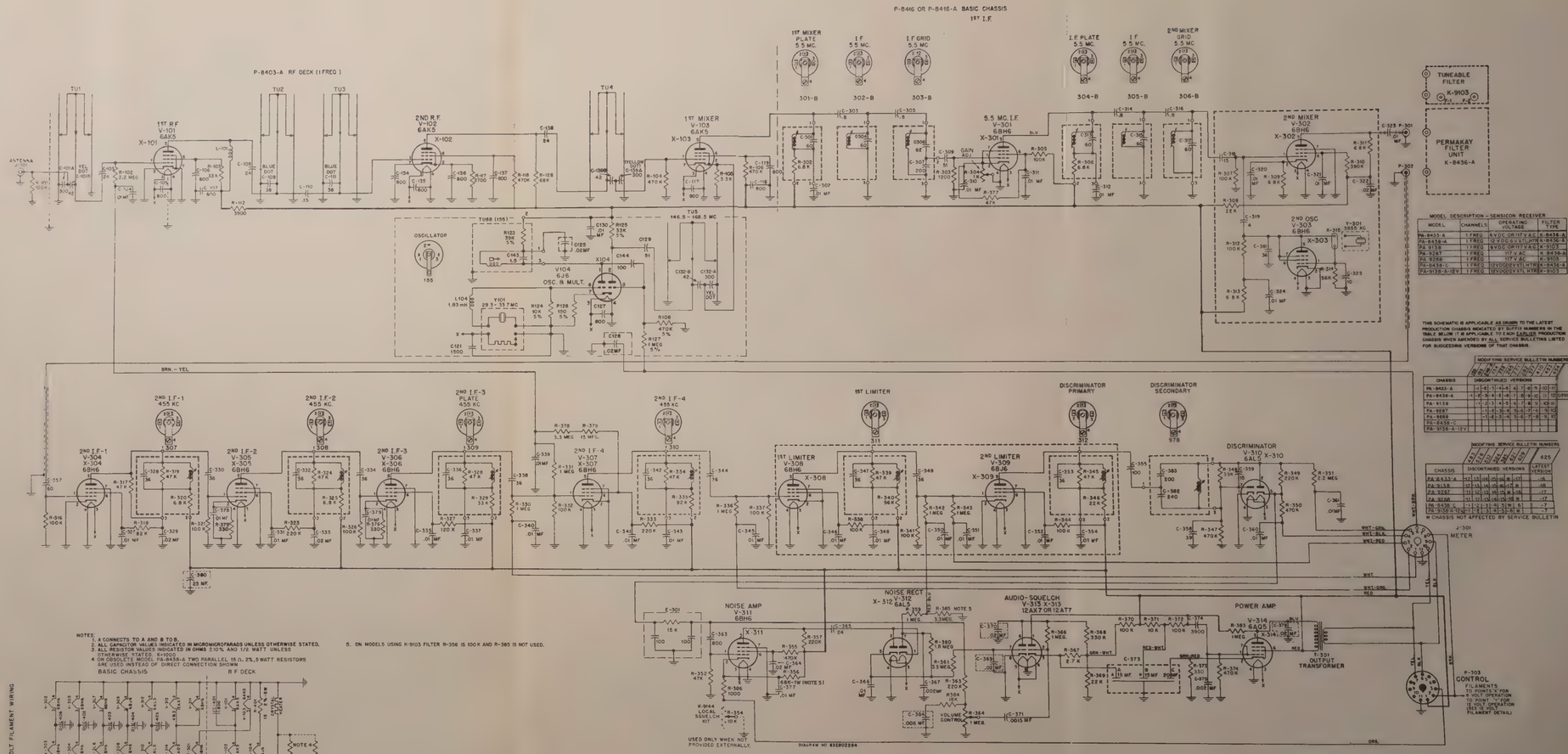
RESISTANCE (NOTE 2)

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9
1ST R.F.	V-101	2.6MEG	0	FIL.	FIL.	62K	94K	0	–	–
2ND. R.F.	V-102	0	2.7K	FIL.	FIL.	268K	520K	2.7K	–	–
1ST. MIXER	V-103	470K	3.3K	FIL.	FIL.	57K	520K	3.3K	–	–
OSCILLATOR NO.1	V-104	95K	87K	FIL.	FIL.	470K	10K	150	–	–
5.5 MC I.F.	V-301	1200	0-1K	FIL.	FIL.	62K	37K	0-1K	–	–
2ND MIXER	V-302	100K	6.8K	FIL.	FIL.	84K	462K	0	–	–
2ND OSCILLATOR	V-303	56K	0	FIL.	FIL.	156K	156K	156K	–	–
1ST I.F.	V-304	100K	0	FIL.	FIL.	57K	139K	0	–	–
2ND I.F.	V-305	100K	330	FIL.	FIL.	57K	277K	0	–	–
3RD I.F.	V-306	100K	330	FIL.	FIL.	83K	170K	0	–	–
4TH I.F.	V-307	100K	0	FIL.	FIL.	132K	270K	0	–	–
1ST LIMITER	V-308	100K	0	FIL.	FIL.	106K	150K	0	–	–
2ND LIMITER	V-309	100K	0	FIL.	FIL.	72K	150K	0	–	–
DISCRIMINATOR	V-310	0	240K	FIL.	FIL.	210K	19.3K	238K	–	–
NOISE AMPLIFIER	V-311	1 MEG	1.0-9K	FIL.	FIL.	1 MEG	150K	0	–	–
NOISE RECTIFIER	V-312	∞	∞	FIL.	FIL.	2.5MEG	90K	1.5 MEG	–	–
AUDIO SQUELCH	V-313	150K	1.3MEG	22K	FIL.	FIL.	350K	6.3MEG	0	FIL.
POWER AMPLIFIER	V-314	470K	470	FIL.	FIL.	50.3K	50K	470K	–	–
OSCILLATOR NO. 2	V-201	95K	87K	FIL	FIL	470K	10K	150	–	–

*SQUELCH DISCONNECTED 120K

NOTES:
1. OSCILLATOR NO.2 IS USED ONLY FOR 2 CHANNEL OPERATION.
2. RESISTANCE READINGS TAKEN WITH POWER SUPPLY DISCONNECTED.

152-174 MC. SINGLE-FREQUENCY "SENSICON" RECEIVER CHASSIS SCHEMATIC DIAGRAM


P-8416 OR P-8416-A BASIC CHASSIS
1ST I.F.
P-8403-A RF DECK (1 FREQ.)
TUNEABLE FILTER K-9103
PERMAKAY FILTER UNIT K-8436-A
1ST RF V-101 6AK5 X-101
2ND R.F. V-102 6AK5 X-102
1ST MIXER V-103 6AK5 X-103
5.5 MC. I.F. V-301 6BH6 X-301
2ND MIXER V-302 6BH6 X-302
2ND OSC V-303 6BH6 X-303
OSCILLATOR
OSC. & MULT. V104 6J6
2ND I.F.-1 V-304 6BH6 X-304
2ND I.F.-2 V-305 6BH6 X-305
2ND I.F.-3 V-306 6BH6 X-306
2ND I.F.-4 V-307 6BH6 X-307
1ST LIMITER V-308 6BH6 X-308
2ND LIMITER V-309 6BJ6 X-309
DISCRIMINATOR V-310 6AL5 X-310
NOISE AMP V-311 6BH6
NOISE RECT. V-312 6AL5 X-312
AUDIO-SQUELCH V-313 X-313 12AX7 OR 12AT7
POWER AMP V-314 6AQ5
OUTPUT TRANSFORMER T-301
METER J-301
P-303 CONTROL
K-9044 LOCAL SQUELCH KIT
BASIC CHASSIS R.F. DECK
12 VOLT FILAMENT WIRING
DIAGRAM NO 63E802284

MODEL DESCRIPTION - SENSICON RECEIVER

MODEL	CHANNELS	OPERATING VOLTAGE	FILTER TYPE
PA-8433-A	1 FREQ	6VDC OR 117 V A.C.	K-8436-A
PA-8436-A	1 FREQ	12 VDC OR 117 V A.C.	K-8436-A
PA-9138	1 FREQ	12 VDC OR 117 V A.C.	K-9103
PA-9267	1 FREQ	117 V AC	K-8436-A
PA-9268	1 FREQ	117 V AC	K-9103
PA-8436-A	1 FREQ	12 VDC 6 VOLT FILAMENTS	K-8436-A
PA-9138-A-1EV	1 FREQ	12 VDC 6 VOLT FILAMENTS	K-9103

OBSOLETE

THIS SCHEMATIC IS APPLICABLE AS DRAWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN THE TABLE BELOW. IT IS APPLICABLE TO EACH EARLIER PRODUCTION CHASSIS WHEN AUTHORIZED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS.

CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS												
	DISCONTINUED VERSIONS												LATEST VERSION
PA-8433-A	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11		-12 OBSOLETE
PA-8436-A	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10			
PA-9138		-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	
PA-9267		-1	-2	-3	-4	-5	-6	-7	-8	-9	-10		
PA-9268		-1	-2	-3	-4	-5	-6	-7	-8	-9			
PA-8436-C													
PA-9138-A-1EV													

CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS												
	DISCONTINUED VERSIONS												LATEST VERSION
PA-8433-A	-12	-13	-14	-15	-16	-17	-18						-19
PA-9138	-12	-13	-14	-15	-16	-17	-18						-19
PA-9267	-11	-12	-13	-14	-15	-16	-17						-18
PA-9268	-10	-11	-12	-13	-14	-15	-16						-17
PA-8436-C	-11	-12	-13	-14	-15	-16	-17						-18
PA-9138-A-1EV	-11	-12	-13	-14	-15	-16	-17						-18

* CHASSIS NOT AFFECTED BY SERVICE BULLETIN

NOTES:
1. A CONNECTS TO A AND B TO B.
2. ALL CAPACITOR VALUES INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED.
3. ALL RESISTOR VALUES INDICATED IN OHMS ±10% AND 1/2 WATT UNLESS OTHERWISE STATED. K=1000.
4. 1000 OHM RESISTOR R-358-A TWO PARALLEL 15 Ω, 2%, 5 WATT RESISTORS ARE USED INSTEAD OF DIRECT CONNECTION SHOWN
5. ON MODELS USING K-9103 FILTER R-356 IS 100 K AND R-385 IS NOT USED.

MOTOROLA
PART NO. 63E802284
ISSUE - Y 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

Pa-8433-A SENSICON RECEIVER (1-Freq.)
Pa-8438 SENSICON RECEIVER (1-Freq.) with K-9103 Tuneable Filter)
Pa-8267 SENSICON RECEIVER & LOCAL SQUELCH KIT (1-Freq.) (with K-8436-A PERMAKAY Filter)
Pa-8268 SENSICON RECEIVER & LOCAL SQUELCH KIT (1-Freq.) (with K-9103 Filter Replacement Kit)

Reference:
Schematic Diagram
63E802286

NOTE

This parts list is arranged by kits, i.e., basic chassis, RF decks, etc. When ordering replacement parts specify part number, description, schematic diagram number, diagram issue, and reference symbol of the part.

1. P-8433-A P-8433-A SENSICON RECEIVER CHASSIS (Basic)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS.
C 358	[illegible]	Fixed: ceramic; .01 mf +80-20%; [illegible]
C 359	[illegible]	[illegible]
C 360	[illegible]	[illegible]
C 361	[illegible]	[illegible]
C 362	[illegible]	[illegible]
C 363	[illegible]	[illegible]
C 364	[illegible]	[illegible]
C 365	[illegible]	[illegible]
C 366	[illegible]	[illegible]
C 367	[illegible]	[illegible]
C 368	[illegible]	[illegible]
C 369	[illegible]	[illegible]
C 370	[illegible]	[illegible]
C 371	[illegible]	[illegible]
C 372	[illegible]	[illegible]
C 373	[illegible]	[illegible]
C 373A	[illegible]	[illegible]
C 373B	[illegible]	[illegible]
C 373C	[illegible]	[illegible]
C 374	21KB37996	Fixed: ceramic, disc; 3900 mmf ±10%; 500 vdcw
C 375	[illegible]	Same as C 367
C 376	[illegible]	Same as C 369
C 377	[illegible]	Same as C 302
C 378	[illegible]	Same as C 302
C 379	[illegible]	Same as C 302
C 380	8A892986	Fixed: oil filled; tubular; .25 mf ±20%; 400 vdcw
C 381	[illegible]	Same as C 303
C 384	8K891314	Fixed: oil filled, tubular; .006 mf ±20%; 400 vdcw
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
E 301	21A813318	CAPACITOR-RESISTOR ASSEMBLY, Consisting of: RESISTOR, fixed: carbon; 15,000 ohm ±20% CAPACITOR, fixed: silver paint on ceramic form, dual, 100 mmf ±20%, 300 vdcw
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
J 301	9A86864	CONNECTOR. Receptacle: female; 11 contact; polarised; round; black plastic base, METER
P 301	28K674006	CONNECTORS. Plug: male; single contact; round; [illegible]
[illegible]	[illegible]	[illegible]
P 364	18K891109	[illegible]
[illegible]	[illegible]	[illegible]
P 368	6R2096	RESISTORS. Fixed: carbon; 1200 ohm ±10%; 1/2 w; ins. Variable: wire wound; 1000 ohm; GAIN ADJUSTMENT
P 369	[illegible]	[illegible]
P 370	[illegible]	[illegible]
P 371	6R8320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w, ins.
P 372	[illegible]	[illegible]
P 373	6R6022	Fixed: carbon; 330 ohm ±10%; 1/2 w, ins.
P 374	[illegible]	[illegible]
P 375	[illegible]	[illegible]
P 376	[illegible]	[illegible]
P 377	[illegible]	[illegible]
P 378	[illegible]	[illegible]
P 379	6R4/6065	Fixed: carbon, 15 megohm ±10%; 1/2 w, ins.
P 383	[illegible]	[illegible]

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		RESISTORS.
R 314	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w, ins.
R 316	[illegible]	Same as R 305
R 317	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w, ins.
R 318	6R5644	Fixed: carbon; 82,000 ohm ±10%; 1/2 w; ins.
R 321	[illegible]	Same as R 305
R 323	6R6407	Fixed: carbon; 220,000 ohm ±10%; 1/2 w; ins.
R 326	[illegible]	Same as R 305
R 327	6R5631	Fixed: carbon; 120,000 ohm ±10%; 1/2 w; ins.
R 330	6R6046	Fixed: carbon; 1 megohm ±10%; 1/2 w; ins.
R 331	[illegible]	Same as R 330
R 332	[illegible]	Same as R 305
R 333	[illegible]	Same as R 323
R 336	[illegible]	Same as R 330
R 337	[illegible]	Same as R 305
R 338	[illegible]	Same as R 305
R 341	[illegible]	Same as R 305
R 342	[illegible]	Same as R 330
R 343	[illegible]	Same as R 305
R 344	[illegible]	Same as R 305
R 347	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 348	6R6487	Fixed: carbon; 39,000 ohm ±10%; 1/2 w, ins.,
R 349	[illegible]	Same as R 323
R 350	[illegible]	Same as R 347
R 351	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 352	[illegible]	Same as R 317 except used only in P-8416 Basic Chassis
R 353	[illegible]	NOT USED
R 355	[illegible]	Same as R 347
P 356	6R6236	Fixed; carbon; 68,000 ohm ±10%; 1/2 w; ins.; p/o 1; used only with models using the K-8436-A PERMAKAY Filter; p/o P-8416 only
	or 6R5031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.; used only with models using the K-9103 TUNEABLE Filter; p/o P-8416-A only
R 357	[illegible]	Same as R 323
P 358	[illegible]	NOT USED
R 359	[illegible]	Same as R 330
R 360	6R488215	Fixed: carbon; 1.8 megohm ±10%; 1/2 w; ins,
R 361	6R6497	Fixed: carbon; 3.3 megohm ±10%; 1/2 w; ins,
R 363	[illegible]	Same as R 323
R 364	18K891109	Variable; carbon; 1 megohm ±30% VOLUME CONTROL
R 366	[illegible]	Same as R 330
R 367	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins,
R 368	6R2096	Fixed: carbon; 330,000 ohm ±10%; 1/2 w; ins,
R 369	[illegible]	Same as R 308
R 370	[illegible]	Same as R 305
R 371	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w, ins,
R 372	[illegible]	Same as R 305
R 373	6R6022	Fixed: carbon; 330 ohm ±10%; 1/2 w, ins,
R 374	[illegible]	Same as R 347
R 375	[illegible]	Same as R 373
R 376	[illegible]	Same as R 373
R 377	[illegible]	Same as R 317
R 378	[illegible]	Same as R 361
R 379	6R4/6065	Fixed: carbon, 15 megohm ±10%; 1/2 w, ins, Same as R 330

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		RESISTORS.
R 384	6R5591	Fixed: carbon; 18,000 ohm ±10%; 1/2 w; ins, Same as R 361 except used only with models using the K-8436-A PERMAKAY Filter; not used with models using the K-9103 TUNEABLE Filter; p/o P-8416 only
R 385	[illegible]	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins,
		TRANSFORMER.
T 301	25K837004	AF: output; 5000 ohm at 55 ma, dc to 3.2 ohm
		TUBES
V 301	6BJ6	Electron
V 302		Same as V 301
V 303		Same as V 301
V 304		Same as V 301
V 305		Same as V 301
V 306		Same as V 301
V 307		Same as V 301
V 308		Same as V 301
V 309	6BJ6	Electron
V 310	6AL5	Electron
V 311		Same as V 301
V 312		Same as V 310
V 313	12AX7 or 12AT7	Electron
V 314	6AQ5	Electron
		SOCKETS.
X 301	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; includes center shield and tube shield base; saddle mounting
X 302		Same as X 301
X 303		Same as X 301
X 304		Same as X 301
X 305		Same as X 301
X 306		Same as X 301
X 307		Same as X 301
X 308		Same as X 301
X 309		Same as X 301
X 310		Same as X 301
X 311	9B87123	Tube: female; 7 contact; miniature; black phenolic base; includes center shield
X 312		Same as X 330
X 313	9B86868	Tube; female; 9 contact; miniature; black phenolic base; includes center shield
X 314		Same as X 311
X 315	9A40050	Crystal: female; 2 contact; mica filled bakelite base

2. K-8414 COIL KIT (15c-376 mc.)

		COILS.
301B	24K811628	IF: 1st Mixer Plate; 5.5 mc,
302B	24K811629	IF: 5.5 mc,
303B	24K811627	IF: Grid; 5.5 mc,
304B	24K811628	IF: Plate; 5.5 mc,
305B	24K811629	IF: 5.5 mc,
306B	24K811649	IF: 2nd Mixer Grid; 5.5 mc,
307	24B890723	IF: 2nd IF-1; 455 kc,
308	24B890723	IF: 2nd IF-2; 455 kc,
309	24B891317	IF: 2nd IF-3; Plate; 455 kc,
310	24B890722	IF: 2nd IF-4; 455 kc,
311	24B890721	IF: 1st Limiter
312	24B804673	IF: Discriminator Primary
978	24B811978	IF: Discriminator Secondary
		CAPACITOR.
C 301	21R400448	Fixed; ceramic; 60 mmf ±10%; 500 vdcw; p/o 301-B

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS.
C 304		NOT USED
C 306	21R2716	Fixed: silver mica; 82 mmf ±10%; 500 vdcw; p/o 303B
C 307	21R2748	Fixed: silver mica; 200 mmf ±10%; 500 vdcw; p/o 303B
C 313		Same as C 301 except p/o 304B
C 315		Same as C 301 except p/o 305B
C 317		Same as C 301 except p/o 306B
C 328	21R87127	Fixed: ceramic; 35 mmf ±5%; 500 vdcw; p/o 307
C 332		Same as C 328 except p/o 308
C 336		Same as C 328 except p/o 309
C 342		Same as C 328 except p/o 310
C 345		Same as C 328 except p/o 311
C 353		Same as C 328 except p/o 312
C 382	21K811932	Fixed: silver mica; 240 mmf ±3%; 500 vdcw; p/o P-8419
C 383	21K811933	Fixed: silver mica; 200 mmf ±3%; 500 vdcw; p/o 978
		RESISTORS.
R 302	6R6428	Fixed: carbon; 6800 ohm ±10%; 1/2 w; ins.; p/o 301B
R 306	[illegible]	Same as R 302 except p/o 304B
R 319	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.; p/o 307
R 320	[illegible]	Same as R 302 except p/o 307
R 324	[illegible]	Same as R 319 except p/o 308
R 325	[illegible]	Same as R 302 except p/o 308
R 328	[illegible]	Same as R 319 except p/o 309
R 329	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.; p/o 309
R 334	[illegible]	Same as R 319 except p/o 310
R 335	6R5644	Fixed: carbon; 82,000 ohm ±10%; 1/2 w; ins.; p/o 310
R 339	[illegible]	Same as R 319 except p/o 311
R 340	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.; p/o 311
R 345	[illegible]	Same as R 319 except p/o 312
R 346	6R6397	Fixed: carbon; 22,000 ohm ±10%; 1/2 w; ins.; p/o 312

3. P-8403-A RF DECK (1-Freq.) 152-174 mc.

		CAPACITORS.
C 101	51A890640	Fixed: ceramic; assembly; 2 section; disc; coded: YELLOW DOT; p/o TU1; consists of: 300 mmf ±0-20 mmf; section 42 mmf ±1 mmf; section (includes ferrule, center wire and eyelet) NOTE: Field Replacement Not Recommended
C 101A		
C 101B		
C 102		NOT USED
C 103	21R38932	Fixed: ceramic; 24 mmf ±5%; 50v vdcw
C 104	21K801139	Fixed: ceramic; .01 mf +80-20%; 450 vdcw; disc.
C 105	21B893233	Fixed: ceramic; 600 mmf; 450 vdcw; disc.
C 106		Same as C 105
C 107		Same as C 105
C 108		Same as C 102
C 109	51A890641	Fixed: ceramic; 1 section; 38 mmf ±1 mmf; disc; coded; BLUE DOT; p/o TU2 (includes ferrule, center wire and eyelet) NOTE: Field Replacement Not Recommended
C 110	21A881064	Fixed; molded; .15 mmf (.14 mmf min. - .18 mmf max.) tubular
C 111		Same as C 109 except p/o TU3
C 112		NOT USED
C 113		NOT USED
C 114		NOT USED

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS.
C 115		NOT USED
C 116		NOT USED
C 117		Same as C 105
C 118		Same as C 105
C 119		Same as C 105
C 120		NOT USED
C 121	21B800801	Fixed: ceramic; .0015 mf min, ±100% max.; 500 vdcw; disc.
C 122		NOT USED
C 123		NOT USED
C 124		NOT USED
C 125	8K85984	Fixed; oil filled; .02 mf ±20% 400 vdcw; metal; tubular
C 126		NOT USED
C 127		Same as C 105
C 128		Same as C 125
C 129	21R83198	Fixed: ceramic; 51 mmf ±5%; 500 vdcw
C 130		Same as C 104
C 131		NOT USED
C 132		Same as C 101 except p/o TU 5
C 133		NOT USED
C 134		Same as C 105
C 135		Same as C 105
C 136		Same as C 105
C 137		Same as C 105
C 138		Same as C 103
C 139		Same as C 101 except p/o TU 4
C 143	21A780120	Fixed: ceramic; rectangular; 1.5 mmf ±.25 mmf; 500 vdcw; p/o TU 6B
C 144	21R38224	Fixed: ceramic; tubular; 100 mmf ±5%; 500 vdcw
J 101	9A87120	CONNECTOR. Receptacle: female; single contact round; mica filled phenolic Insulator; ANTENNA
		COILS.
L 101	24A891309	RF: choke; 1.2 microhenries
L 102		NOT USED
L 103		NOT USED
L 104	24A824958	RF: choke; 1.83 microhenries
		RESISTORS.
R 101	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins,
R 102	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w., ins,
R 103	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins,
R 104	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins,
R 105	6R6581	Fixed: carbon; 3300 ohm ±10%; 1/2 w; ins, Same as R 104
R 106		
R 107		NOT USED
R 108	6R5795	Fixed: carbon; 470,000 ohm ±5%; 1/2 w; ins,
R 109		NOT USED
R 110		NOT USED
R 111		NOT USED
R 112	6R5659	Fixed: carbon; 3900 ohm ±10%; 1/2 w; ins,
R 113		NOT USED
R 114		NOT USED
R 115		NOT USED
R 116		NOT USED
R 117	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins,
R 118		Same as R 104
R 119		NOT USED
R 120		NOT USED
R 121		NOT USED
R 122		NOT USED

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
R 123	6R400076	RESISTORS. Fixed: carbon, 39,000 ohm ±5%; 1/2 w; ins.; p/o TU 6B
R 124	6R5556	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins,
R 125	6R2068	Fixed: carbon; 33,000 ohm ±5%; 1/2 w; ins,
R 126	6R5645	Fixed: carbon; 150 ohm ±5%; 1/2 w; ins,
R 127	6R5587	Fixed: carbon; 1 megohm ±5%; 1/2 w; ins,
R 128	6R6074	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins,
		SOCKETS.
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; includes center shield, and tube shield base; saddle mounting
X 102		Same as X 101
X 103		Same as X 101
X 104		Same as X 301
X 105	9A30451	Crystal: female; 4 contact; mica filled base

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAVITIES.
TU 1		Tuned: RF; Antenna: includes: 47A890656 PIPE, outer 1V890648 TUBE, inductor adjustment; assembly consisting of: 47A890649 TUBE, inductor adjustment 47A890653 TUBE, center contact 28A890651 PLUG, inductor
TU 2		Reference Part C 101 (Field modification not recommended) Tuned: RF; 1st RF-1; includes: 47A890656 PIPE, outer 1V890648 TUBE, inductor adjustment; assembly consisting of: 47A890649 TUBE, inductor adjustment 47A890653 TUBE, center contact 28A890651 PLUG, inductor
TU 3		Reference Part C 109 (Field modification not recommended) Tuned: RF; 1st RF-2; includes: 47A890656 PIPE, outer 1V890648 TUBE, inductor adjustment; assembly consisting of: 47A890649 TUBE, inductor adjustment 47A890653 TUBE, center contact 28A890651 PLUG, inductor
TU 4		Reference Part C 113 (Field modification not recommended) Tuned: RF; 2nd RF; includes: 47A890656 PIPE, outer 1V890648 TUBE, inductor adjustment; assembly consisting of: 47A890649 TUBE, inductor adjustment 47A890653 TUBE, center contact 28A890651 PLUG, inductor
TU 5		Reference Part C 139 (Field modification not recommended) Tuned: RF, Oscillator; includes: 47A890656 PIPE, outer 1V890648 TUBE, inductor adjustment; assembly consisting of: 47A890649 TUBE, inductor adjustment 47A890653 TUBE, center contact 28A890651 PLUG, inductor
TU 6B		Reference Part C 119 (Field modification not recommended)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
TU 6B	24B825155	COIL ASSEMBLY; RF, Oscillator, consists of: 24A811977 COIL, RF Oscillator Reference part C 143 Reference part R 123
		TUBES.
V 101	6AK5	Electron
V 102		Same as V 101
V 103		Same as V 101
V 104	6Z6	Electron
		SOCKETS.
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; includes center shield, and tube shield base; saddle mounting
X 102		Same as X 101
X 103		Same as X 101
X 104		Same as X 301
X 105	9A30451	Crystal: female; 4 contact; mica filled base

4. K-9144 LOCAL SQUELCH KIT

R 354	18A890193	RESISTOR. Variable: wire-wound, 10,000 ohm ±10%

NON-REFERENCED PARTS LIST

	36K81229	KNOB. Control, for 1/4" O.D. Shaft: black phenolic, with stamped depressed arrow, includes #8-32 set screw

5. FILTER

	1U800788	K-8436-A PERMAKAY ELECTRICAL FILTER
	1U802888	K-9103 TUNABLE FILTER

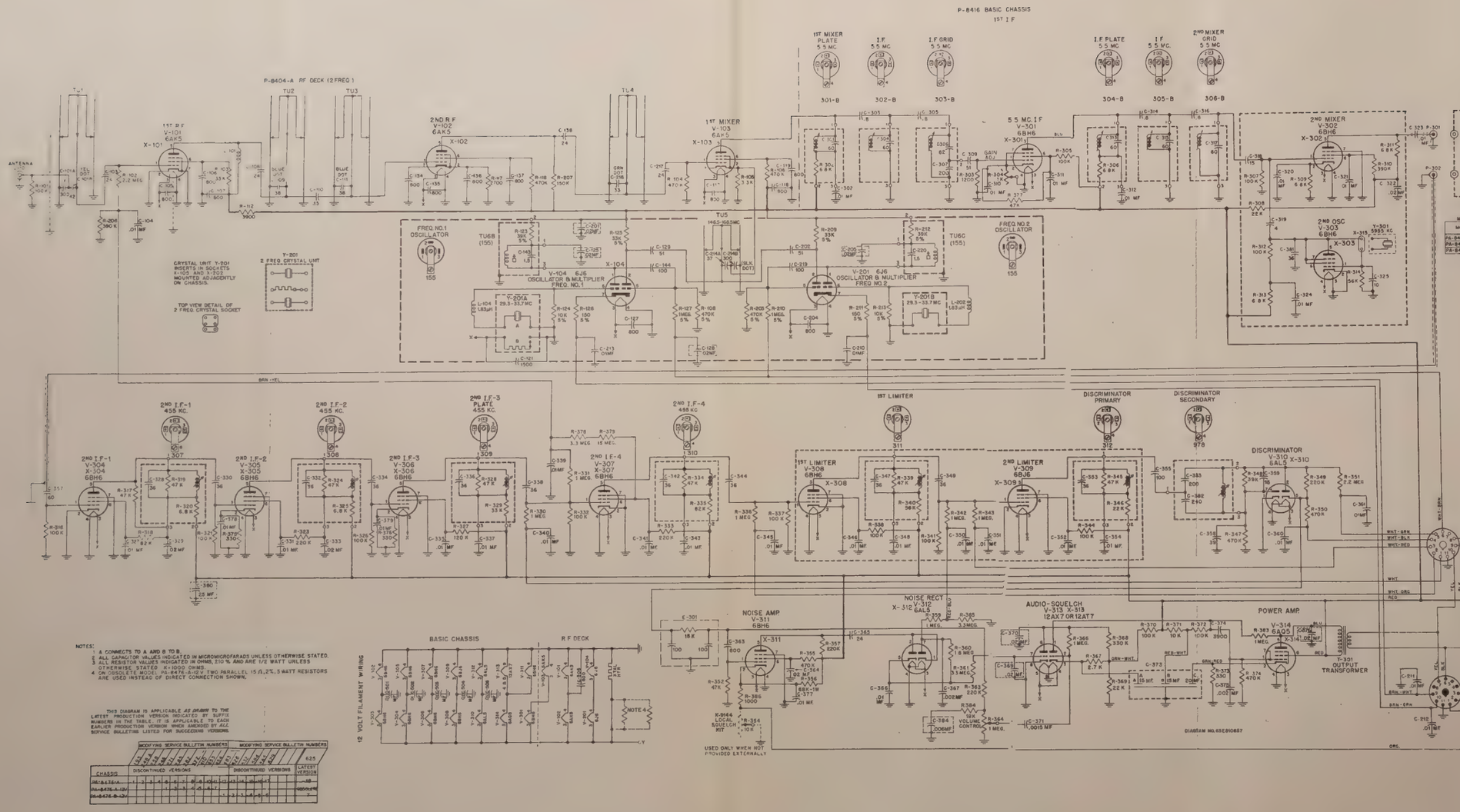
6. CRYSTALS

NOTE

Crystal Units are not part of the Receiver chassis or RF Decks and must be ordered separately.

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CRYSTAL UNITS.
Y 101	1U801424	Quartz: Receiver Control, 29,000 - 34,000 MC, with 6 volt heater unit MOTOROLA TYPE D01; when ordering frequency must be specified Consists of the following CRYSTAL UNIT-REPLACEABLE PARTS: 1U801411 CRYSTAL UNIT, quartz: Receiver Control, 29,000 - 34,000 MC; MOTOROLA TYPE D01; when ordering frequency must be specified 1U891880 HEATER and THERMOSTAT ASSEMBLY: MOTOROLA TYPE DEX consisting of: 1V891886 HEATER and BASE ASSEMBLY: 6 volt 1C892365 THERMOSTAT, crystal unit 1S891444 HOUSING, crystal, thermostat and heater 64A892473 PLATE, crystal unit baffle 41A891451 RING, crystal housing retainer Used with single frequency receiver
Y 301	1U801407	Quartz: Receiver IF, 5455 kc, MOTOROLA TYPE A04, when ordering frequency must be specified
	or 1U825400	Quartz: Receiver IF, 5455 - 5855 kc., MOTOROLA TYPE A12, when ordering frequency must be specified
		CRYSTAL UNITS.
	or 1U825402	Quartz: Receiver Control: Two Frequency, 2", 70000 - 33,7000 mc., unit, 6 volt heater unit. MOTOROLA TYPE D31, when ordering frequency must be specified Consists of the following CRYSTAL UNIT-REPLACEABLE PARTS: 1U801411 CRYSTAL UNIT, quartz: Receiver Control, 29,000 - 34,000 MC; MOTOROLA TYPE D01; when ordering frequency must be specified 1U891880 HEATER and THERMOSTAT ASSEMBLY: MOTOROLA TYPE DEX consisting of: 1V891886 HEATER and BASE ASSEMBLY: 6 volt 1C892365 THERMOSTAT, crystal unit 1S891444 HOUSING, crystal, thermostat and heater 64A892473 PLATE, crystal unit baffle 41A891451 RING, crystal housing retainer Used with single frequency receiver
	or 1C837260	THERMOSTAT, crystal unit 64A836478 PLATE, crystal unit baffle 41A891451 RING, crystal housing retainer 1S891444 HOUSING, crystal, thermostat and heater

152-174 MC. TWO-FREQUENCY "SENSICON" RECEIVER CHASSIS SCHEMATIC DIAGRAM


P-8404-A RF DECK (2 FREQ.)
P-8416 BASIC CHASSIS
1ST I F
ANTENNA
1ST R F V-101 6AK5 X-101
2ND R F V-102 6AK5 X-102
1ST MIXER V-103 6AK5 X-103
5.5 MC. I F V-301 6BH6 X-301
2ND MIXER V-302 6BH6 X-302
2ND OSC V-303 6BH6 X-303
PERMAKAY FILTER UNIT K-8436-A
FREQ. NO. 1 OSCILLATOR
FREQ. NO. 2 OSCILLATOR
V-104 6J6 OSCILLATOR & MULTIPLIER FREQ. NO. 1
V-201 6J6 OSCILLATOR & MULTIPLIER FREQ. NO. 2
CRYSTAL UNIT Y-201 INSERTS IN SOCKETS X-103 AND Y-202 MOUNTED ADJACENTLY ON CHASSIS.
TOP VIEW DETAIL OF 2 FREQ. CRYSTAL SOCKET
2 FREQ. CRYSTAL UNIT
2ND I.F.-1 455 KC. V-304 6BH6
2ND I.F.-2 455 KC. V-305 6BH6
2ND I.F.-3 PLATE 455 KC. V-306 6BH6
2ND I.F.-4 455 KC. V-307 6BH6
1ST LIMITER V-308 6BH6 X-308
2ND LIMITER V-309 6BJ6 X-309
DISCRIMINATOR PRIMARY
DISCRIMINATOR SECONDARY
DISCRIMINATOR V-310 6AL5 X-310
NOISE AMP V-311 6BH6 X-311
NOISE RECT V-312 6AL5 X-312
AUDIO-SQUELCH V-313 X-313 12AX7 OR 12AT7
POWER AMP V-314 6AQ5
T-301 OUTPUT TRANSFORMER
J-301 METER
P-103 CONTROL
BASIC CHASSIS
R.F DECK
12 VOLT FILAMENT WIRING
MODEL DESCRIPTION - SENSICON RECEIVER
PA-8476 A 2 FREQ. 6 V DC OR 117 V A.C. X-8436-A
PA-8476-A-12 V 2 FREQ. 12 VDC (+ XTL. HTR.) X-8436-A OBSOLETE
PA-8476-B-12 V 2 FREQ. 12 VDC (12 V TL HTR.) X-8436-A
DIAGRAM NO. 63E810687

NOTES:
1. A CONNECTS TO A AND B TO B.
2. ALL CAPACITOR VALUES INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED.
3. ALL RESISTOR VALUES INDICATED IN OHMS, ±10 % AND ARE 1/2 WATT UNLESS OTHERWISE STATED. K = 1000 OHMS.
4. OR CRYSTAL TS MCCOY PA-8476-A-12 V TWO PARALLEL 15 Ω, 2 %, 5 WATT RESISTORS ARE USED INSTEAD OF DIRECT CONNECTION SHOWN.

THIS DIAGRAM IS APPLICABLE AS DRAWN TO THE LATEST PRODUCTION VERSION INDICATED BY SUFFIX NUMBERS IN THE TABLE. IT IS APPLICABLE TO EACH EARLIER PRODUCTION VERSION WHEN AMENDED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS.

CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS — DISCONTINUED VERSIONS	MODIFYING SERVICE BULLETIN NUMBERS — DISCONTINUED VERSIONS	LATEST VERSION
PA-8476-A	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17		-18
PA-8476-A-12V	1 2 3 4 5 6 7		8
PA-8476-B-12V	1 2 3 4 5 6		7

MOTOROLA
PART NO. 63E810687
ISSUE - Q 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

PA-8476-A SENSICON RECEIVER (2-Freq.)

Reference:
Schematic Diagram
63E81068?

NOTE

This parts list is arranged by kits, i.e., basic chassis, RF decks, etc. When ordering replacement parts specify part number, description, schematic diagram number, diagram issue, and reference symbol of the part.

1. P-8416 & P-8416-A SENSICON RECEIVER CHASSIS (Basic)

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 302	Z1A801139	Fixed: ceramic; .01 mf +80-20%; 600 vdcw; disc.
C 303	Z1K475679	Fixed: molded; .8 mmf ±.1 mmf; 500 vdcw
C 304	Z1R83198	Same as C 303
C 305		Fixed: ceramic; 51 mmf ±5%; 500 vdcw
C 310		Same as C 302
C 311		Same as C 302
C 312		Same as C 302
C 314		Same as C 303
C 326		Same as C 303
C 328	Z1R41867	Fixed: ceramic; 15 mmf ±5%; 500 vdcw
C 329	Z1R87131	Fixed: ceramic; 4 mmf ±.5 mmf; 500 vdcw
C 320		Same as C 302
C 321		Same as C 302
C 322	Z1R401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 323		Same as C 302
C 324		Same as C 302
C 325	Z1R38223	Fixed: ceramic; 10 mmf ±5%; 500 vdcw
C 327		Same as C 302
C 329		Same as C 322
C 330	Z1R87127	Fixed: ceramic; 36 mmf ±5%; 500 vdcw
C 331		Same as C 302
C 333		Same as C 322
C 334		Same as C 330
C 335		Same as C 302
C 337		Same as C 302
C 338		Same as C 330
C 339		Same as C 302
C 340		Same as C 302
C 341		Same as C 302
C 343		Same as C 302
C 344		Same as C 330
C 345		Same as C 302
C 346		Same as C 302
C 348		Same as C 302
C 349		Same as C 340
C 350		Same as C 302
C 351		Same as C 302
C 352		Same as C 302
C 354		Same as C 302
C 355	Z1K475489	Fixed: ceramic; 100 mmf ±5%; 500 vdcw
C 357	Z1R691316	Fixed: ceramic; 60 mmf ±10%; 500 vdcw
C 358	Z1R34985	Fixed: ceramic; 30 mmf ±5%; 500 vdcw

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 359	Z1R400533	Fixed: ceramic; disc; 15 mmf ±10%; 500 vdcw
C 360		Same as C 302
C 361		Same as C 302
C 362		NOT USED
C 363	Z1K830159	Fixed: silver mica; 800 mmf ±3%; 100 vdcw
C 364		Same as C 322
C 365	Z1R38932	Fixed: ceramic; tubular; 24 mmf ±5%; 500 vdcw
C 366		Same as C 302
C 367	Z1K837746	Fixed: ceramic; disc; 2000 mmf ±10%; 500 vdcw
C 368		NOT USED
C 369	8K85984	Fixed: oil filled; .02 mf ±20%; 400 vdcw; metal tubular
C 370		Same as C 369
C 371	Z1B800801	Fixed: ceramic; .0015 mf GMV ±100% max.; 500 vdcw
C 372		NOT USED
C 373	Z3K81256	Fixed: electrolytic; 3 section; consisting of:
C 373A		△15 mf +50-10%; 250 vdcw; section
C 373B		□15 mf +50-10%; 250 vdcw; section
C 373C		▭20 mf +100-10%; 25 vdcw; section
C 374	Z1K837996	Fixed: ceramic; disc; 3900 mmf ±10%; 500 vdcw
C 375		Same as C 367
C 376		Same as C 369
C 377		Same as C 302
C 378		Same as C 302
C 379		Same as C 302
C 380	8A892986	Fixed: oil filled; tubular; .25 mf ±20%; 400 vdcw
C 381		Same as C 330
C 384	8K891314	Fixed: oil filled; tubular; .006 mf ±20%; 400 vdcw
		CAPACITOR-RESISTOR ASSEMBLY:
E 301	Z1A813318	Consisting of:
		RESISTOR, fixed: carbon; 15,000 ohm ±20%
		CAPACITOR, fixed: silver paint on ceramic form; dual; 100 mmf ±20%; 300 vdcw
		CONNECTOR,
J 301	9A86864	Receptacle: female; 11 contact; polarized; round; black plastic base; METER
		CONNECTORS,
P 301	Z8K474006	Plug: male; single contact; round; bakelite insulator
P 302		Same as P 301
P 303	Z8A86870	Receptacle: male; 11 contact; polarized; round; black bakelite base
		RESISTORS,
R 303	6R6493	Fixed: carbon; 1200 ohm ±10%; 1/2 w; ins.
R 304	18A21972	Variable: wire-wound; 1000 ohm; GAIN ADJUSTMENT
R 305	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w. ins.
R 307		Same as R 305
R 308	6R6397	Fixed: carbon; 22,000 ohm ±10%; 1/2 w; ins.
R 309	6R6428	Fixed: carbon; 6800 ohm ±10%; 1/2 w; ins.
R 310	6R5646	Fixed: carbon; 190,000 ohm ±10%; 1/2 w. ins.
R 311		Same as R 309
R 312		Same as R 305
R 313		Same as R 309

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		RESISTORS,
R 314	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.
R 316		Same as R 305
R 317	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 318	6R5644	Fixed: carbon; 82,000 ohm ±10%; 1/2 w; ins.
R 321		Same as R 305
R 323	6R6407	Fixed: carbon; 220,000 ohm ±10%; 1/2 w; ins.
R 326		Same as R 305
R 327	6R5631	Fixed: carbon; 120,000 ohm ±10%; 1/2 w; ins.
R 330	6R6046	Fixed: carbon; 1 megohm ±10%; 1/2 w; ins.
R 331		Same as R 330
R 332		Same as R 305
R 333		Same as R 323
R 336		Same as R 330
R 337		Same as R 305
R 338		Same as R 305
R 341		Same as R 305
R 342		Same as R 330
R 343		Same as R 330
R 344		Same as R 305
R 347	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 348	6R6487	Fixed: carbon; 39,000 ohm ±10%; 1/2 w; ins.
R 349		Same as R 323
R 350		Same as R 347
R 351	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 352		Same as R 317 except used only in P-8416 Basic Chassis
R 353		NOT USED
R 355		Same as R 347
R 356	6R6236	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins.; p/o 1 used only with models using the K-8436-A PERMAKAY Filter p/o P-8416 only
	or 6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.; used only with models using the K-9103 Tuneable Filter; p/o P-8416-A only
R 357		Same as R 323
R 358		NOT USED
R 359		Same as R 330
R 360	6R488215	Fixed: carbon; 1.8 megohm ±10%; 1/2 w; ins.
R 361	6R6497	Fixed: carbon; 3.3 megohm ±10%; 1/2 w; ins.
R 363		Same as R 323
R 364	18K891109	Variable: carbon; 1 megohm ±30%; VOLUME CONTROL
R 366		Same as R 330
R 367	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins.
R 368	6R2096	Fixed: carbon; 330,000 ohm ±10%; 1/2 w; ins.
R 369		Same as R 308
R 370		Same as R 305
R 371	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 372		Same as R 305
R 373	6R6022	Fixed: carbon; 330 ohm ±10%; 1/2 w; ins.
R 374		Same as R 347
R 375		Same as R 373
R 376		Same as R 373
R 377		Same as R 317
R 378		Same as R 361
R 379	6R476065	Fixed: carbon; 15 megohm ±10%; 1/2 w, ins.

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		RESISTORS,
R 383		Same as R 330
R 384	6R5591	Fixed: carbon; 18,000 ohm ±10%; 1/2 w; ins.
R 385		Same as R 361 except used only with models using the K-8436-A PERMAKAY Filter; not used with models using the K-9103 TUNEABLE Filter; p/o P-8416 only
R 386	6R6229	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins.
		TRANSFORMER,
T 301	Z5K837004	AF: output; 5000 ohm at 55 ma. dc to 3.2 ohm
		TUBES,
V 301	6BH6	Electron
V 302		Same as V 301
V 303		Same as V 301
V 304		Same as V 301
V 305		Same as V 301
V 306		Same as V 301
V 307		Same as V 301
V 308		Same as V 301
V 309	6BJ6	Electron
V 310	6AL5	Electron
V 311		Same as V 301
V 312		Same as V 310
V 313	12AX7 or 12AT7	Electron
V 314	6AQ5	Electron
		SOCKETS,
X 301	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; includes center shield and tube shield base; saddle mounting
X 302		Same as X 301
X 303		Same as X 301
X 304		Same as X 301
X 305		Same as X 301
X 306		Same as X 301
X 307		Same as X 301
X 308		Same as X 301
X 309		Same as X 301
X 310		Same as X 301
X 311	9B87123	Tube: female; 7 contact; miniature; black phenolic base; includes center shield
X 312		Same as X 311
X 313	9B86868	Tube: female; 9 contact; miniature; black phenolic base; includes center shield
X 314		Same as X 311
X 315	9A40050	Crystal: female; 2 contact; mica filled bakelite base

2. K-8414 COIL KIT (152-174 mc.)

		COILS.
301B	24K811628	IF: 1st Mixer Plate; 5.5 mc.
302B	24K811629	IF: 5.5 mc.
303B	24K811627	IF. Grid; 5.5 mc.
304B	24K811628	IF: Plate; 5.5 mc.
305B	24K811629	IF: 5.5 mc.
306B	24K811629	IF. 2nd Mixer Grid; 5.5 mc.
307	24B890723	IF: 2nd IF-1; 455 kc.
308	24B890723	IF: 2nd IF-2; 455 kc.
309	24B891317	IF: 2nd IF-3, Plate, 455 kc.
310	24B890722	IF: 2nd IF-4, 455 kc.
311	24B890721	IF: 1st Limiter
312	24B804673	IF: Discriminator Primary
978	24B811978	IF: Discriminator Secondary

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 301	Z1R400448	Fixed: ceramic; 60 mmf ±10%; 500 vdcw; p/o 301B
C 304		Same as C 301 except p/o 302B
C 306	Z1R2716	Fixed: silver mica; 82 mmf ±10%; 500 vdcw; p/o 303B
C 307	Z1R2748	Fixed: silver mica; 200 mmf ±10% 500 vdcw; p/o 303B
C 313		Same as C 301 except p/o 304B
C 315		Same as C 301 except p/o 305B
C 317		Same as C 301 except p/o 306B
C 328	Z1R87127	Fixed: ceramic; 36 mmf ±5%; 500 vdcw; p/o 307
C 332		Same as C 328 except p/o 308
C 336		Same as C 328 except p/o 309
C 342		Same as C 328 except p/o 310
C 347		Same as C 328 except p/o 311
C 353		Same as C 328 except p/o 312
C 382	Z1K811932	Fixed: silver mica; 240 mmf ±3%; 500 vdcw; p/o 978
C 383	Z1K811933	Fixed: silver mica; 200 mmf ±3%; 500 vdcw; p/o 978
		RESISTORS,
R 302	6R6428	Fixed: carbon; 6800 ohm ±10%; 1/2 w; ins.; p/o 301B
R 306		Same as R 302 except p/o 304B
R 319	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.; p/o 307
R 320		Same as R 302 except p/o 307
R 324		Same as R 319 except p/o 308
R 325		Same as R 302 except p/o 308
R 328		Same as R 319 except p/o 309
R 329	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.; p/o 309
R 334		Same as R 319 except p/o 310
R 335	6R5644	Fixed: carbon; 82,000 ohm ±10%; 1/2 w; ins.; p/o 310
R 339		Same as R 319 except p/o 311
R 340	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.; p/o 311
R 345		Same as R 319 except p/o 312
R 346	6R6397	Fixed: carbon; 22,000 ohm ±10%; 1/2 w; ins.; p/o 312

3. FILTER

	1U800788	K-8436-A PERMAKAY ELECTRICAL FILTER

4. P-8404-A RF DECK (2-Freq.) 152-174 mc.

The majority of components listed in the preceding 100 series reference symbols are common to both the P-8403-A RF Deck (1-Freq.) and the P-8404-A RF Deck (2-Freq.); however, in certain instances specific components of the 1-Freq. circuit are replaced with components of a different value in the 2-Freq. circuit. These components are noted with an asterisk.

		CAPACITORS,
*C201	8K85984	Fixed: oil filled, .02 mf ±20%, 400 vdcw; metal; tubular
C 202	Z1R83198	Fixed: ceramic, 51 mmf ±5%; 500 vdcw
C 203		NOT USED
C 204	Z1B893233	Fixed: ceramic; disc; 800 mmf; 450 vdcw
C 205		Same as C 201
C 206		NOT USED
C 207		NOT USED
C 208		NOT USED
C 209		NOT USED
C 210	Z1K801139	Fixed: ceramic; disc; .01 mf +80-20%, 450 vdcw
C 211		p/o K-9141 parts list section
C 212		p/o K-9141 parts list section
C 213		Same as C 210

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 214	51K892262	Fixed: ceramic; disc; assembly; coded; BLACK DOT; p/o TU 5; consisting of:
C 214A		37 mmf ±1 mmf; section
C 214B		300 mmf +0-20 mmf; section (includes ferrule, center wire and eyelet)
		NOTE: Field Replacement Not Recommended.
C 215		NOT USED
C 216	51K802868	Fixed: ceramic; disc; assembly; 1 section; 33 mmf ±1 mmf; coded; GREEN DOT; p/o TU 4 (includes ferrule, center wire and eyelet)
		NOTE: Field Replacement Not Recommended.
C 217	Z1R38932	Fixed; ceramic; 24 mmf ±5%; 500 vdcw
C 218		NOT USED
C 219	Z1R38224	Fixed; ceramic; tubular; 100 mmf ±5%; 500 vdcw
C 220	Z1A780120	Fixed: ceramic; rectangular; 1.5 mmf ±.25 mmf; 500 vdcw; p/o TU 6C
		COILS,
L 201		NOT USED
L 202	24A824968	RF: choke; 1.82 microhenries
		RESISTORS,
R 201		NOT USED
R 202		NOT USED
R 203	6R5795	Fixed: carbon; 470,000 ohm ±5%; 1/2 w. ins.
R 204		NOT USED
R 205		NOT USED
R 206	6R5646	Fixed: carbon, 390,000 ohm ±10%, 1/2 w, ins.
*R 207	6R6398	Fixed: carbon, 150,000 ohm ±10%; 1/2 w, ins.
R 208		NOT USED
R 209	6R2068	Fixed: carbon; 33,000 ohm ±5%, 1/2 w, ins.
R 210	6R5587	Fixed: carbon, 1 megohm ±5%, 1/2 w, ins.
R 211	6R5645	Fixed: carbon; 150 ohm ±5%, 1/2 w, ins.
R 212	6R40007b	Fixed: carbon, 39,000 ohm ±5%, 1/2 w, ins., p/o TU 6C
R 213	6R5556	Fixed: carbon, 10,000 ohm ±5%, 1/2 w; ins.
		COIL ASSEMBLY: RF,
TU 6C	24B825155	Oscillator, consists of: 24B811977 COIL, RF Oscillator Reference Part C 220 Reference Part R 212
		TUBE,
V 201	6J6	Electron
		SOCKETS,
X 201	9K87124	Tube: female; 7 contact, miniature, mica filled phenolic base; includes center shield
X 202	9A40050	Crystal: female; 2 contact; rectangular; mica filled base

5. K-9141 TWO FREQUENCY SENSICON RECEIVER CONVERSION KIT

		CAPACITORS,
C 211	Z1A801139	Fixed: ceramic; .01 mf +80-20%, 600 vdcw; disc.
C 212		Same as C 211

6. CRYSTALS

NOTE

Crystal Units are not part of the Receiver Chassis or RF Decks and must be ordered separately.

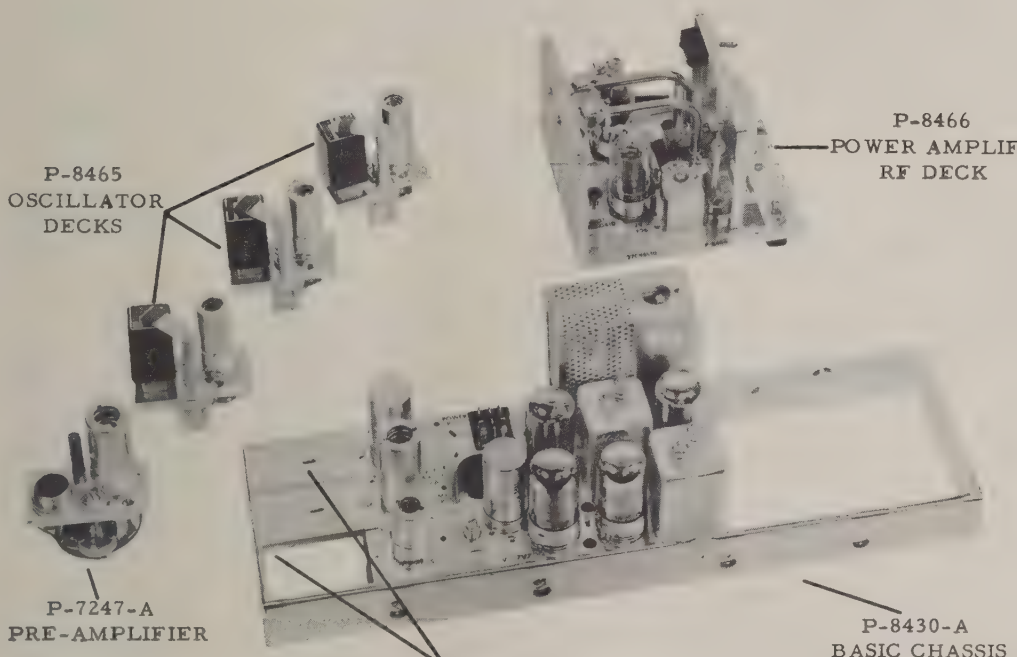
REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CRYSTAL UNITS,
Y 201	1U80144	Quartz: Receiver Control, Two-Frequency, 29,000 - 34,000 mc, with 6 volt heater unit, MOTOROLA TYPE E01, when ordering frequency must be specified Consists of the following CRYSTAL REPLACEABLE PARTS 1U80145, CRYSTAL UNIT, quartz; Receiver Control 29,000 - 34,000 MC, MOTOROLA TYPE F01. (2 required when ordering frequency must be specified 1U84863 HEATER and THERMOSTAT ASSEMBLY, MOTOROLA TYPE E01, consisting of: 1V84864 HEATER and BASE ASSEMBLY, 6 volt 1C892865 THERMOSTAT, crystal unit 64A800664 PLATE, crystal unit baffle, R.H. 64A800665 PLATE, crystal unit baffle, L.H. 41A800804 CLIP, crystal holddown 41K800805 CLIP, thermostat holddown 30A84236 GASKET, housing 45B84236 HOUSING, crystal, thermostat and heater Used with Two-Frequency Receiver
Y 301	1U80140?	Quartz; Receiver IF, 5955 kc, MOTOROLA TYPE A04

Motorola®

THE "RESEARCH" LINE

30 WATT TRANSMITTER CHASSIS

152-174 MC. BASE STATION



CHASSIS	DESCRIPTION
PA-8461-B	Single-Frequency
PA-8462-B	Two-Frequency
PA-8463-B	Three-Frequency
PA-8461-BP	Single-Frequency with microphone pre-amplifier
PA-8462-BP	Two-Frequency with microphone pre-amplifier
PA-8461-C	Single-Frequency with coaxial antenna Change-over relay
PA-8462-BC	Two-Frequency with coaxial antenna Change-over relay
PA-8462-CP	Two-Frequency with coaxial antenna Change-over relay and microphone pre-amplifier

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

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10/54-CP

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Issue - L

NOMINAL PERFORMANCE SPECIFICATIONS

BASIC UNIT	PA-8461-B, PA-8462-B & PA-8463-B PA-8461-BP, PA-8462-BP PA-8461-C, PA-8462-BC PA-8462-CP
FREQUENCY	152-174 mc.
CRYSTAL FREQ. MULTIPLICATION	Twenty-four (24) times
RF POWER OUTPUT	30 watts, 152-167 mc.; 25 watts, 167-174 mc.
POWER SOURCE	Separate power supply. 6.3 volt heater circuit.
SPURIOUS EMISSION	All spurious emissions are attenuated at least 70 db. below carrier level. Harmonic radiations are attenuated 60 db. or more.
FREQUENCY STABILITY & TEMPERATURE RANGE	Using an oven-type crystal, the carrier is maintained to within ±1 kc. of assigned center frequency or approximately ±.0006% over the ambient temperature range -30°C. to +60°C. (+25°C. reference).
MODULATION	40F3: ±15 kc. for 100% at 1000 cycles
AUDIO INPUT LEVEL	*500 ohm Control Line or Handset: Remote Control — 0.18 volts for 100% at 1000 cycles (approx. -20 db.) Magnetic Mic. ("Suffix P" Units Only) Local Control — 0.01 volts for 100% at 1000 cycles (approx. -60 db.) *Military Mic. (Cannot be used with "Suffix P" Units): — 0.25 volts for 100% at 1000 cycles (approx. -17 db.)
PLATE POWER SUPPLY	Separate Unit: 420 volts at 200 ma. 250 volts at 80 ma.
TUBE COMPLEMENT AND FUNCTION	(1) 6AK6 - RF Oscillator (1-Freq.) (2) 6AK6 - RF Oscillator (2-Freq.) (3) 6AK6 - RF Oscillator (3-Freq.) 7V7 - Modulator 7V7 - Buffer-1st Doubler 7C5 - Tripler 7C5 - 2nd Doubler 2E26 - Doubler-Driver (2) 2E26 - Final Amplifiers 12AX7 or 12AT7 - I.D.C. Amplifier 6AL5 - I.D.C. Limiter 12AU7 - Pre-Amplifier ("Suffix P" units only)
NUMBER OF TUNED CIRCUITS	11 tuned circuits following the modulator including 3 double permeability-tuned transformer-coupled multiplier circuits, a series tuned doubler-driver transformer and a multiple tuned output network.
NOMINAL POWER INPUT	Standby: 70 watts Transmit: 250 watts
DIMENSIONS	16-1/2" long x 4-7/8" wide x 5-1/2" high, overall
WEIGHT	Approximately 7 lbs.

* Measured in series with 40 ohm equivalent resistance.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

1. DESCRIPTION

The basic MOTOROLA 30 watt, 152-174 megacycle transmitter is a 10 tube, single-frequency transmitter for operation from a separate power supply. Except for the addition of one or two oscillator decks the two and three-frequency transmitters are identical to the basic single-frequency version. Transmitter chassis with "Suffix P" designations are identical to corresponding standard models with the exception that a P-7247-A Microphone Pre-Amplifier is added in place of one of the K-8582-A Blank Oscillator Decks. Refer to the chassis complement paragraph for specific variations. The three-frequency transmitter is available on special order only.

Multi-channel transmitters are available with maximum frequency separations of ±300 kc. from circuit resonance without degradation of single-frequency nominal performance specifications. Two-frequency transmitter chassis with frequency separations less than 300 kc. are normally phased at the factory on the higher of the two frequencies employed. In specific cases where channel separations exceed these limitations and where one channel is used much more frequently than the other, the transmitter may be aligned on the primary frequency (frequency most often used). Three-frequency transmitters may be phased at the mid-frequency (F 2) with the end frequencies (F 1 and F 3) having a maximum allowable separation of 300 kc. on either side. By this method, a maximum overall separation of 600 kc. is allowed without degradation of single-frequency nominal performance specifications.

The transmitter circuit incorporates an oven type crystal controlled oscillator, a single angular phase modulator, controlled by the MOTOROLA I.D.C. "INSTANTANEOUS DEVIATION CONTROL" circuit, four tuned intermediate frequency doubler circuits and a parallel final amplifier circuit.

The MOTOROLA I.D.C. "INSTANTANEOUS DEVIATION CONTROL" circuit is an integral part of the transmitter. This circuit is factory adjusted to limit the modulation deviation to ±15 kc. for 100% under all audio input conditions. It is instantaneous in action while controlling the steepness of the modulating wave introduced into the angular modulator. It also prevents receiver distortion, loss of intelligibility and decrease in the signal-to-noise ratio which may be due to excess modulation deviation.

All of the transmitter operating voltages are supplied from a separate power supply chassis.

2. CHASSIS COMPLEMENT

a. PA-8461-B

The PA-8461-B is a single-frequency 30 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(1)	P-8465	Oscillator Deck
(2)	K-8582-A	Blank Oscillator Decks
(1)	P-8466	Power Amplifier RF Deck
(1)	K-8468	Chassis Kit

b. PA-8462-B

The PA-8462-B is a two-frequency 30 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(2)	P-8465	Oscillator Decks
(1)	K-8582-A	Blank Oscillator Deck
(1)	P-8466	Power Amplifier RF Deck
(1)	K-8468	Chassis Kit

c. PA-8463-B

The PA-8463-B is a three-frequency 30 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(3)	P-8465	Oscillator Decks
(1)	P-8466	Power Amplifier RF Deck
(1)	K-8468	Chassis Kit

NOTE

Three-frequency transmitters are available on special order only.

d. PA-8461-C

The PA-8461-C is similar to model PA-8461-B differing only with the employment of a P-8466-A RF Output Deck (with coaxial antenna change-over relay) in place of the P-8466 Output Deck (with non-coaxial antenna change-over relay).

e. PA-8462-BC

The PA-8462-BC is similar to the PA-8462-B differing only with the employment of a P-8466-A

RF Output Deck (with coaxial antenna change-over relay) in place of the P-8466 RF Output Deck (with non-coaxial antenna change-over relay).

f. PA-8461-BP, PA-8462-BP, and PA-8462-CP

The MOTOROLA "Suffix P" versions of the PA-8461-B, PA-8462-B and PA-8462-C units employ a P-7247-A Microphone Pre-Amplifier Unit mounted in the position which is provided for the third crystal oscillator deck. These models are available for locally controlled "BL" and "BY" station equipment. The incorporation of this pre-amplifier permits the use of a dynamic or magnetic microphone such as the MOTOROLA P-274-F Dynamic, P-7245 or P-7245-D "Magnamike" microphone.

3. PRE-ALIGNMENT NOTES

The transmitter was tuned and adjusted for its exact operating frequency prior to shipment from the factory. Unless it has been handled roughly while in transit or otherwise abused or tampered with, it should require no further adjustment before placing it in service, other than to align the final RF amplifier stage to the antenna. If, for any reason, it becomes necessary for the transmitter to be retuned, the following instructions outline the correct procedure.

Bear in mind, however, that the values will vary with a change in line voltage and will decrease with an increase in the life of the tubes and other components of the transmitter. Each time a transmitter is aligned or tested, the readings should be entered in a logbook.

IMPORTANT

It is illegal for anyone to tune or adjust a radio transmitter, except under direct supervision of a licensed radio operator who must hold a Radio-Telephone License of applicable class.

a. Equipment Necessary for Alignment

(1) Alignment Meters

(a) Complete metering facilities for transmitter alignment and checking have been provided in the MOTOROLA "BR", "BL", "BYR" and "BY" cabinets. References to meter selector switch positions in the alignment procedure to follow are applicable for fixed station metering as well as for MOTOROLA Portable Test Set measurement.

NOTE

The selector switch should be kept in the positions designated "T" for "in-place" transmitter metering of "BY" and "BYR" models.

(b) The MOTOROLA P-8501-A Test Sets may be utilized for bench alignment and metering of base station transmitters.

The MOTOROLA P-8501-A Test Set is designed and engineered for use with MOTOROLA "RESEARCH" Line equipment. Simplified meter switching, an expanded meter range, and two crystal sockets have made the P-8501-A Test Set a universal instrument for the testing of MOTOROLA transmitters and receivers.

Early versions of the MOTOROLA Portable Test Sets may be used for alignment of "RESEARCH" Line equipment with only slight modification in the alignment procedure outlined for the P-8501-A Test Set.

(2) Meter for Audio Adjustment - Vacuum tube voltmeter or other suitable 0-2.5 volt scale DC meter (Simpson Model 260 or equivalent).

(3) Alignment Tools, Part Nos. 66A891487 and 66A891488.

(4) Power Supply - Preferably one designed for the transmitter under test. When bench testing jumper terminals 21 and 16 on the P-8434 or P-8464 Power Supply.

(5) Dummy Antennas

(a) Bird RF Wattmeter

(b) P-7208 RF Dummy Load for use with the P-8501-A Test Set.

(c) Lamp Dummy Antenna. Refer to Dummy Antenna Load Construction Detail (Part Number 69A880390).

b. Connection for Test Meter

(1) In-place alignment using fixed station metering equipment.

(a) "BR" or "BL" Models

Insert the miniature 2-pin meter plug into the TRANSMITTER receptacle below the selector switch on the P-8449-B or P-8449-C Series Meter Switching Panel Chassis.

NOTE

Be sure the 11-conductor metering cable is properly connected to both the metering panel chassis and the transmitter chassis.

(b) "BY" or "BYR" Models

Be sure the 11 pin connector on the end of the transmitter metering cable (p/o K-8677 or K-8689 Series Metering Kits) is plugged into the METER receptacle on the transmitter chassis.

(2) Bench Alignment Using Portable Test Set

(a) Place the REC-XMTR-0-50 switch in the XMTR position.

(b) Place the GRID CURRENT-METER-FIELD STRENGTH switch in the METER position.

(c) Use the XMTR-ON switch to turn "on" the transmitter during alignment.

NOTE

Transmitter plate voltage is measured in selector switch position #7 on the P-8501-A Test Set.

c. Miscellaneous

(1) C 103 located on the P-8465 Oscillator Deck is preset and sealed at the factory. THE SETTING SHOULD NOT BE CHANGED IN THE FIELD. Should it be accidentally changed or if the crystal is changed, check with an approved frequency meter (MOTOROLA F4MU-24B Series) and only then adjust C 103 to the specified frequency. The setting should then be resealed.

(2) Adjustment screws on T 1A, L 3 and L 4 have hexhead locknuts which must be loosened before the screws can be adjusted. They should be re-tightened only by hand. Care should be taken not to disturb the screw settings when tightening the locknuts.

(3) Measuring Transmitter B+ Voltage

Transmitter B+ may be read with the aid of a voltmeter connected to the B+ receptacle on the transmitter final amplifier deck chassis. In the "BR" and "BL" stations the B+ is measured using the 0-1000 VDC meter in the cabinet. The RED meter plug lead is normally connected to the 400 V receptacle on the power supply chassis.

(4) Calculation of Crystal Frequency

f_c = carrier frequency

f_o = crystal frequency

$f_o = \frac{f_c}{24}$

Example: $f_c = 152.39$ mc.

$f_o = \frac{152.39}{24}$

$f_o = 6,349.6$ kc.

4. ALIGNMENT NOTES

TYPICAL BENCH TEST SET-UP

IMPORTANT

Read the following steps.

a. Preliminary Steps

(1) Attach an antenna dummy load to the (ANT) connector.

(2) Connect the power plug to the transmitter.

(3) Place the Transmitter in Operation.

(a) Set the HI-LO power switch in LO position.

(b) Turn "on" the filaments. Wait 30 seconds before applying high voltage to transmitter (keying).

(c) Key Transmitter

1. When using fixed station meters:

On "BL" or "BY" models key transmitter by means of standard microphone included with model. On "BR" or "BYR" models key transmitter by means of auxiliary P-255-A Military Microphone or equivalent connected to the microphone receptacle of the power supply.

2. When using a P-8501-A Test Set

The transmitter may be keyed by pressing the XMTR-ON switch on the test set, or by means of an auxiliary P-255-A Military Type Microphone or equivalent connected to test set microphone receptacle.

CAUTION

Never have the transmitter plate voltage turned on for more than a few seconds at a time until the transmitter is completely "tuned up". The plate current is excessive in untuned circuits and may result in damage to tubes and parts.

b. Tune 1A

(1) Set the meter selector switch on the test set to position 3. (No reading will be observed on position 2 at any time.) The meter now reads the grid current of V 3. T 1A is tuned to 2 times the crystal frequency.

(2) Adjust the tuning adjustment screws on T 1A until a maximum is obtained. Adjustment of one of the screws may have some effect on the other; therefore, adjust one and then the other, going back and forth until a definite maximum is obtained.

c. Tune T 2

(1) Set the meter selector switch on the test set to position -4. This position indicates grid current of V 4. The circuit is tuned to 6 times the crystal frequency.

(2) Peak the meter reading by adjusting the screws on T 2, going back and forth as in the preceding step.

d. Tune L 3 and L 4

(1) Set the meter selector switch to position 5. The meter reads grid voltage of V 5. The coils are tuned to 12 times the crystal frequency.

(2) Adjust L 3 and L 4 to obtain a meter peak.

NOTE

An immediate meter reading of about 10 does not indicate alignment of L 3 and L 4; this reading is due to fixed bias which is supplied by the power supply. A definite meter peak will be observed when the circuit is resonant. (HI-LO switch in LO position.)

(3) If the transmitter is badly mis-aligned, or if it is being aligned to a new frequency, some difficulty may be experienced in finding resonance of L 3 and L 4 using the grid voltage of V 5 as the indication of resonance. Under these conditions, set the meter selector switch to position -4 and tune L 3. A dip in the meter reading is an indication of resonance. The meter selector switch should then be returned to position 5 and L 4 tuned for a maximum reading. L 3 can now be adjusted for maximum.

e. To Tune T 3 and PA GRID Capacitors (C 20 and C 21)

Set the meter selector switch to position 6; adjust T 3 carefully for a meter peak; adjust PA GRID capacitors, C 20 and C 21 for a peak. Adjustment of T 3 is critical and should be tuned carefully and slowly. The circuits are tuned to 24 times the crystal frequency.

NOTE

An immediate meter reading of about 10 does not indicate alignment of T 3, C 20 and C 21 (PA GRID). Maximum reading should be at least 25 when the selector switch is in position 6. The initial reading is due to fixed bias which is supplied by the power supply. (HI-LO switch in LO position.)

Difficulty in finding resonance of T 3 may be experienced if the PA grid circuit is badly mis-aligned. Should this occur, set the meter switch to position 5. Adjust T 3 for a dip in the reading of position 5. Return the meter to position 6 and tune C 20 & C 21 (PA GRID capacitors) for a maximum. Peak this reading by re-adjusting T 3.

If the meter reading in position 5 is above 25, it is possible that no indication of resonance will be observed in position 6 while tuning T 3, C 20 & C 21 (HI-LO Switch in LO position). Should this occur, decrease the reading on position 5 to a value of 20-25 by detuning T 1. Follow the procedure outlined in step e. above and continue with the remainder of the alignment. T 1 should be retuned with the switch in the HI position after the transmitter is aligned.

f. To Tune PA Plate Circuit

(1) Set the meter to read PA plate current by setting the selecting switch to the PA position.

NOTE

The position of the PA BALANCING switch on the transmitter determines which tube is being measured. If the switch handle is thrown to the right, the meter reads plate current of the right hand tube; if to the left the left hand tube is being measured.

(2) Unload the plate circuit as follows:

Back the coupling loop out as far as possible by means of its adjustment screw. (To back out coupling loop, turn screw clockwise.)

(3) Tune the PA PLATE tuning screw for a meter dip (minimum reading).

(4) The two capacitor plates composing C 24 located at the top end of the PA PLATE lines have been set and locked at the factory. These plates are used for rough tuning and require only one setting for any frequency channel. The PA PLATE adjustment screw should be used for a normal tuning of the PA PLATE. However, should capacitor C 24 require adjustment, the following steps should be taken.

(a) Remove the PA COVER. CAUTION-THERE IS NON-INSULATED HIGH VOLTAGE IN THE PA SECTION THAT IS DANGEROUS; therefore, use extreme care when making any adjustments with the PA cover removed. Do not press the push-to-talk button on the microphone or actuate any transmitter test switch while making adjustments on the power amplifier, other than tuning C 24. When tuning C 24, use the insulated alignment tool provided. DO NOT USE A SCREWDRIVER.

(b) Adjust PA PLATE tuning screw so that the lower edge of the shorting bar is approximately 1/8" above the chassis top.

(c) Loosen the locknuts holding the plate and tune the plates for a minimum reading using the insulated tuning tool provided.

(d) Lock the two plates in position being careful not to rotate the plates. Replace PA cover.

(e) Continue with the normal alignment procedure.

(5) When the meter has been properly dipped as outlined in the preceding step, place the HI-LO Power Switch in the HI position and adjust ANT TRIMMER (C 27) for minimum reading. Retune the PA PLATE tuning screw to be sure the meter is still at a minimum.

g. Balancing the PA

Flip the PA BALANCING switch left and right and note whether the meter reads the same in both positions. If the readings are not the same, note the difference. They may be balanced by adjusting the PA GRID capacitors as follows:

(1) If a higher reading is obtained when the toggle switch is to the left, vary the adjustment of the PA GRID capacitor of the LEFT HAND tube so that the plate current drops an amount equal to 1/4 of the difference between the two plate current readings.

Reset the meter to read PA GRID voltage as in step e. Retune the PA GRID capacitor of the RIGHT HAND TUBE for a maximum reading. This restores the grid circuit to resonance.

(2) If a higher reading is obtained when the toggle switch is to the right, vary the adjustment of the PA GRID capacitor of the RIGHT HAND tube so that the plate current drops an amount equal to 1/4 of the difference between the two plate current readings.

Reset the meter to read PA GRID voltage as in step e. Retune the PA GRID capacitor of the LEFT HAND tube for a maximum reading. This restores the grid circuit to resonance.

(3) Reset the meter to read PA PLATE current. Recheck the balance by throwing the PA BALANCE switch to the left and to the right and noting any difference on the meter readings. If the meter readings are not equal, repeat (1) through (3) until a balance is obtained.

NOTE

If one tube reads high, the reading is reduced (as outlined above) by increasing the PA GRID trimmer capacity; however, there may be the condition where this adjustment will have little effect on the plate current of that tube. The adjustment also has an opposite effect on the other tube,

causing its plate current to increase. Thus an opposite method of balancing is available; that is, a low reading tube may be increased by adjusting the PA GRID capacitor of the other tube.

BEAR IN MIND, THAT MAXIMUM POWER OUTPUT IS ACHIEVED WHEN THE TRANSMITTER PA IS PROPERLY ALIGNED. THE PLATE CURRENT OF THE TWO TUBES (V 8 & V 9) SHOULD BE EQUAL AND THE PA GRID CAPACITORS (C 20 & C 21) SHOULD BE SO ADJUSTED TO RESONATE THE GRID CIRCUIT.

h. Output Coupling

(1) With the meter still set to read PA PLATE current, adjust the ANT TRIMMER for maximum reading on the meter.

(2) If an RF Wattmeter is available:

The MOTOROLA P-7208 RF Dummy Load may be used with the P-8501-A Test Set to measure RF power output. Refer to P-8501-A Instructions.

(a) Adjust the coupling loop L 11 until the transmitter is loaded to the desired RF power output as indicated on the RF Wattmeter.

NOTE

F.C.C. regulations state:
The power which may be used by a station shall be no more than the minimum required for satisfactory technical operation commensurate with the size of the area to be served and local conditions which affect radio transmission and reception.

Example: Federal Register Volume 14, Number 87, Page 2323, Paragraph 10.106.

(b) Readjust the ANT TRIMMER capacitor C 27 for a maximum reading on the RF Wattmeter.

(c) DO NOT exceed 80 milliamperes plate current (40 microamperes reading on portable test set).

(3) If a dummy load lamp is available:

(a) Adjust the antenna coupling loop L 11 until a maximum brightness has been obtained.

(b) Readjust the ANT TRIMMER C 27 for a maximum operation to the antenna connector on the PA position.

(c) DO NOT exceed 80 milliamperes plate current (40 microamperes reading on portable test set).

(4) To load the antenna:

(a) Connect the antenna to be used for normal operation to the antenna connector on the transmitter chassis.

(b) Adjust the antenna coupling loop L 11 to increase the coupling and tune the PA PLATE through resonance -- note the "dip" at resonance.

(c) Gradually increase the coupling to a point where only a slight "dip" is noticeable when tuning thru resonance. This will indicate the point of maximum output.

(d) DO NOT exceed 80 milliamperes plate current (40 microamperes reading on portable test set).

NOTE

Care should be taken not to over-couple the transmitter to the antenna as the plate current "dip" will disappear and actual power output will be below the maximum value. Also, a false dip may occur which will not be coincident with maximum power output.

When using this method of coupling, it is recommended that a field strength meter (P-8501-A Portable Test Set) be used to check the transmitter for maximum radiation.

i. Summary

(1) With the transmitter turned "on", repeak T 1A, (detuned in step e), T 2, L 3 & L 4, T 3, C 20 & C 21 and recheck balance of the PA tubes.

NOTE

If a field strength meter is available (P-8501-A Portable Test Set), the ANT TRIMMER and COUPLING adjustments

may be adjusted for maximum reading on the field strength meter. The PA plate current reading of 40 (80 ma.) should not be exceeded for each tube of the final amplifier.

(2) When aligning a two-frequency transmitter the set is normally aligned on the higher frequency. When aligning a three-frequency transmitter, tune to the middle frequency. On completion of alignment, check the output on each frequency.

(3) Transmitter Minimum Readings After Final Adjustments.

(a) The values listed below for positions 3, 4, 5, & 6 of the test meter selector switch are minimum readings required to obtain a nominal output from the transmitter. These values are relative and will vary with each unit. However, the readings provide a good indication of power output when compared with normal values previously recorded.

NOTE

When aligning a transmitter operating on a frequency above 162 mc. the minimum meter reading in positions 3, -4, 5 & 6 will be slightly lower than the readings listed above. The higher the transmitter frequency (above 162 mc.), the greater the difference. Transmitters operating on 174 mc. will have readings 10 to 15% lower than those listed below.

(b) In positon 7, the P-8501-A Test Set becomes a transmitter B+ voltmeter with a full scale deflection of 1000 volts.

(c) When using a P-8501-A Test Set

SWITCH POSITION	1	2	3	4	5	6	7	8	PA
METER READING	-	-	20	20	20	25	21	*	40** max. (ea. 2E26)

*NOTE 1: Position 8 reads DC relay control voltage when transmitter is not being keyed and zero (0) when transmitter is being keyed. To obtain actual voltage reading multiply the meter readings of the P-8501-A Test Set by 0.3.

**NOTE 2: True value of PA current as read on the test set is 2000 times scale reading. Example: Scale reading equal to 40 ua. is a true reading of 80 ma.

NOTE 3: The circuits being metered by the P-8501-A Test Set for various selector switch positions are as follows:

SWITCH POSITION	TRANSMITTER CIRCUIT
1	No Connection
2	No Connection
3	Grid Current, Tripler V 3
-4	Grid Current, 2nd Doubler V 4
+4 PA	Power Amplifier Plate Current
5	Grid Voltage, Doubler Driver V 5
6	Grid Voltage, Power Amp. V 8 & V 9
7	PA Plate Voltage
8	Transmitter Relay Control Voltage

NOTE 4: Refer to the factory final test PA reading enclosed with the transmitter. Use this reading as a criterion when re-aligning the transmitter.

NOTE 5: For maximum tube life, it is recommended that the output be coupled just sufficiently to provide dependable communication within your desired range.

(d) When using base station in place meters.

SWITCH POSITION	1	2	3	4	5	6	PA
METER READING	No Ind.	No Ind.	20	20	20	25	80 ma. max. (ea. 2E26)

NOTES

NOTE 1: Base station in-place meter readings are in microamperes except in PA position which is in milliamperes.

Base station front panel test meter has a scale for direct reading in milliamperes. This scale is applicable only when in "PA" metering position.

NOTE 2: Refer to the factory final test PA reading enclosed with the transmitter. Use this reading as a criterion when re-aligning the transmitter.

NOTE 3: For maximum tube life, it is recommended that the output be coupled just sufficiently to provide dependable communication within your desired range.

5. AUDIO ADJUSTMENTS

a. Microphone Level Adjustment ("Suffix P" Versions Only)

The microphone input level control on the preamplifier is adjusted at the factory for normal speech and will normally require no further adjustment.

The procedure for checking and adjusting the input level is as follows: (Read carefully before making adjustments).

(1) Connect a DC vacuum tube voltmeter or other suitable DC voltmeter (Simpson Model 260 or equivalent) between pin 2 of V 7 (6AL5 Clipper tube) and chassis ground.

(2) Set the meter on the lowest (0-2.5 V) DC scale. The meter should read approximately one volt when the "push-to-talk" button is pressed. (The exact meter reading is not important.)

(3) Operate the "push-to-talk" button on the microphone and speak in a normal transmitting voice. If the level control is properly adjusted the meter deflection will remain constant during normal speech. There will be a small variation in meter deflection with slightly louder-than-normal speech.

(4) If a variation in meter deflection is observed when talking into the microphone with a normal transmitting voice, turn the input level control counterclockwise until no change in deflection occurs. The input level control is located adjacent to the microphone receptacle.

(5) As a check, talk into the microphone in a slightly louder-than-normal voice. A small variation in meter deflection should now occur. If no variation in meter deflection is noted, turn the input level control clockwise until a small variation occurs with a slightly louder-than-normal voice.

b. I. D. C. "INSTANTANEOUS DEVIATION CONTROL"

The adjustable I.D.C. circuit has been set for proper operation and sealed at the factory. No attempt should be made to change this adjustment unless a MOTOROLA F4MU-24B Series Station Monitor or equivalent is available to check modulation deviation.

In the event that readjustment of the I.D.C. circuit becomes necessary:

(1) Set up a MOTOROLA F4MU-24B Series Station Monitor for FREQUENCY DEVIATION MEASUREMENT. Refer to the Station Monitor Instruction Manual for measurement instructions.

(2) Turn the monitored transmitter "on" and modulate with a loud sustained oral tone (use the word Ahhhh------).

(3) Adjust the I.D.C. control on the transmitter chassis until the MODULATION DEVIATION meter will swing up to 15 kc. on voice peaks.

NOTE

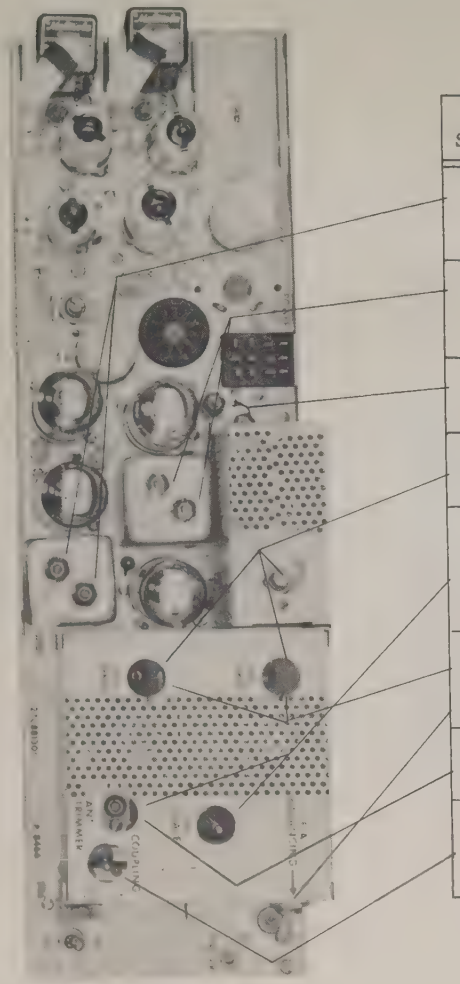
FCC rules and regulations stipulate a maximum allowable modulation deviation in the 152-174 mc. band of ±15 kc.

c. Audio Sensitivity Adjustment

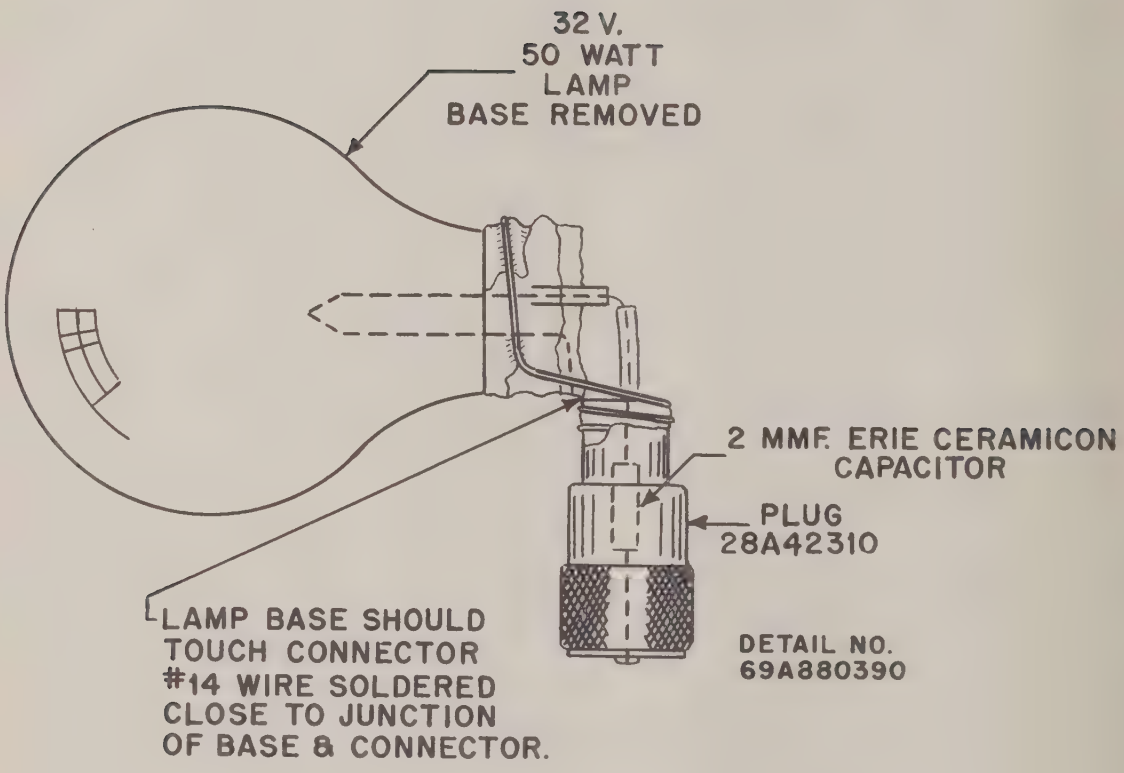
All transmitters described herein except the "Suffix CP and BP" versions have a two level connection to the first I.D.C. amplifier for modifying the basic audio sensitivity of the unit. This is achieved by connecting the input grid lead (pin 2 of V 6, 12AX7) to either of two points as shown on the schematic diagram. When a MOTOROLA Military type carbon microphone or equivalent is to be used with the transmitter, connect the grid lead to position #1 (0.25 volt sensitivity). For remote control applications (500 ohm line), or when a handset is employed, connect the grid lead position #2 (0.18 volt sensitivity).

6. SIMPLIFIED ALIGNMENT PROCEDURE

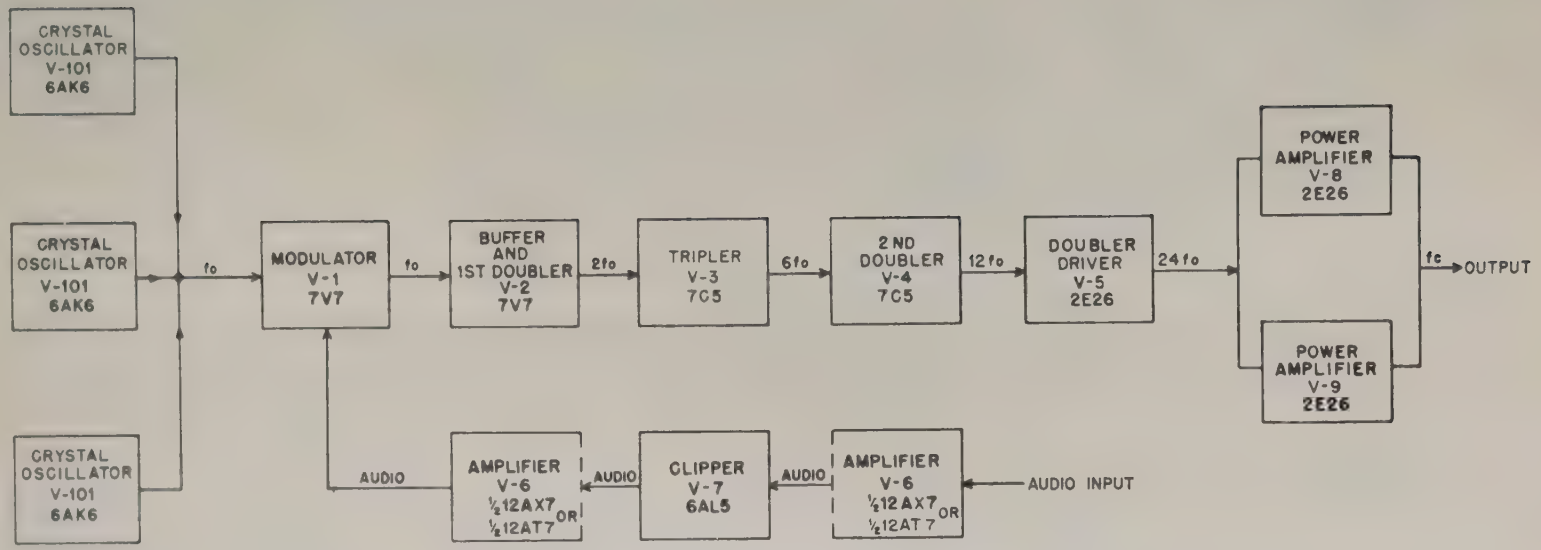
After the serviceman becomes familiar with the alignment of this unit he may use the Simplified Alignment Procedure as a check list. He should not attempt to use the check list until he has followed the complete alignment procedure using the P-8501-A Portable Test Set detailed earlier in this section.



SEQUENCE	METER POSITION	ADJUSTMENT	METER READING	STAGE AND PROCEDURE
Step 1	3	T 1A (primary & secondary)	Maximum	1st doubler plate tripler grid. Turn screws alternately.
Step 2	-4	T 2 (primary & secondary)	Maximum	Tripler plate, 2nd doubler grid. Turn screws alternaltey.
Step 3	5	L 3; L 4	Maximum	2nd doubler plate, driver grid. Turn screws alternately.
Step 4	6	T 3; C 20; C 21 (PA Grids)	Maximum	Driver Plate, PA grids. Adjust T 3 and then C 20 and C 21.
Step 5	PA (+4)	PA plate and C 27 (ANT. TRIMMER)	Minimum	PA plate. Turn COUPLING screw to full clockwise position. Adjust PA PLATE. Adjust ANT. TRIMMER.
Step 6	PA (+4)	C 20, C 21 (PA Grids)	Equal	Adjust PA GRID capacitors C 20, C 21, for equal reading on either position of PA BALANCING switch.
Step 7	PA (+4)	C 27 (ANT. TRIMMER)	Maximum	Adjust ANT. TRIMMER.
Step 8	PA (+4)	L 11 (COUPLING)	As described but less than 80 max.	Antenna coupling. Adjust COUPLING screw for desired RF output. Repeat Step 6.


32 V.
50 WATT
LAMP
BASE REMOVED
2 MMF. ERIE CERAMICON
CAPACITOR
PLUG
28A42310
LAMP BASE SHOULD
TOUCH CONNECTOR
#14 WIRE SOLDERED
CLOSE TO JUNCTION
OF BASE & CONNECTOR.
DETAIL NO.
69A880390

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8461-B, PA-8462-B, PA-8463-B, PA-8461-C AND PA-8462-BC



LEGEND

fo = OSCILLATOR FREQUENCY
fc = CARRIER FREQUENCY
$fo = \frac{fc}{24}$

fc = 24 fo
fo = 6333 TO 7250 KILOCYCLES
fc = 152 TO 174 MEGACYCLES

DIAGRAM NO 63C802354

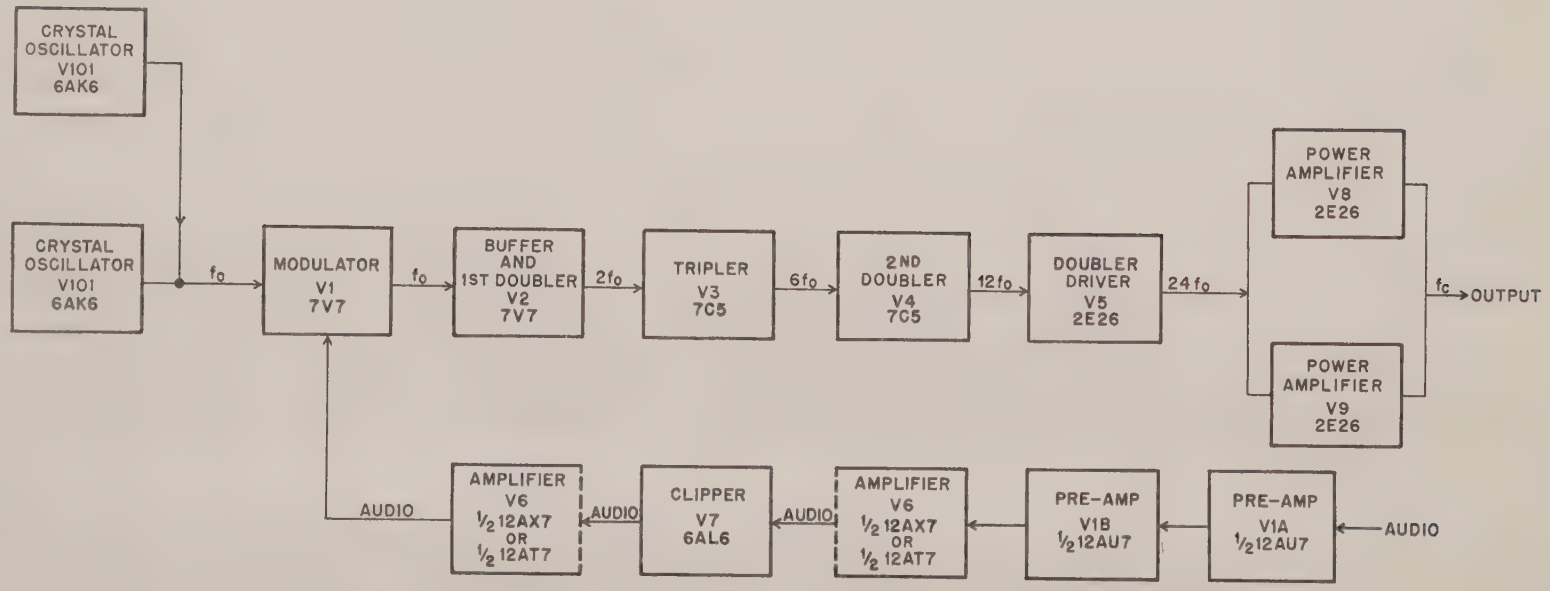
MOTOROLA
PART NO. 63C802354
ISSUE - E 10/54-CP

152-174 MC. 30 WATT TRANSMITTER CHASSIS
BLOCK DIAGRAM

MOTOROLA
PART NO. 63C804354
ISSUE - B 10/54-CP

152-174 MC. 30 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER BLOCK DIAGRAM

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8461-BP, PA-8462-BP AND PA-8462-CP



LEGEND

f_o = OSCILLATOR FREQUENCY

f_c = CARRIER FREQUENCY

$f_o = \frac{f_c}{24}$

$f_c = 24 f_o$

f_o = 6333 TO 7250 KILOCYCLES

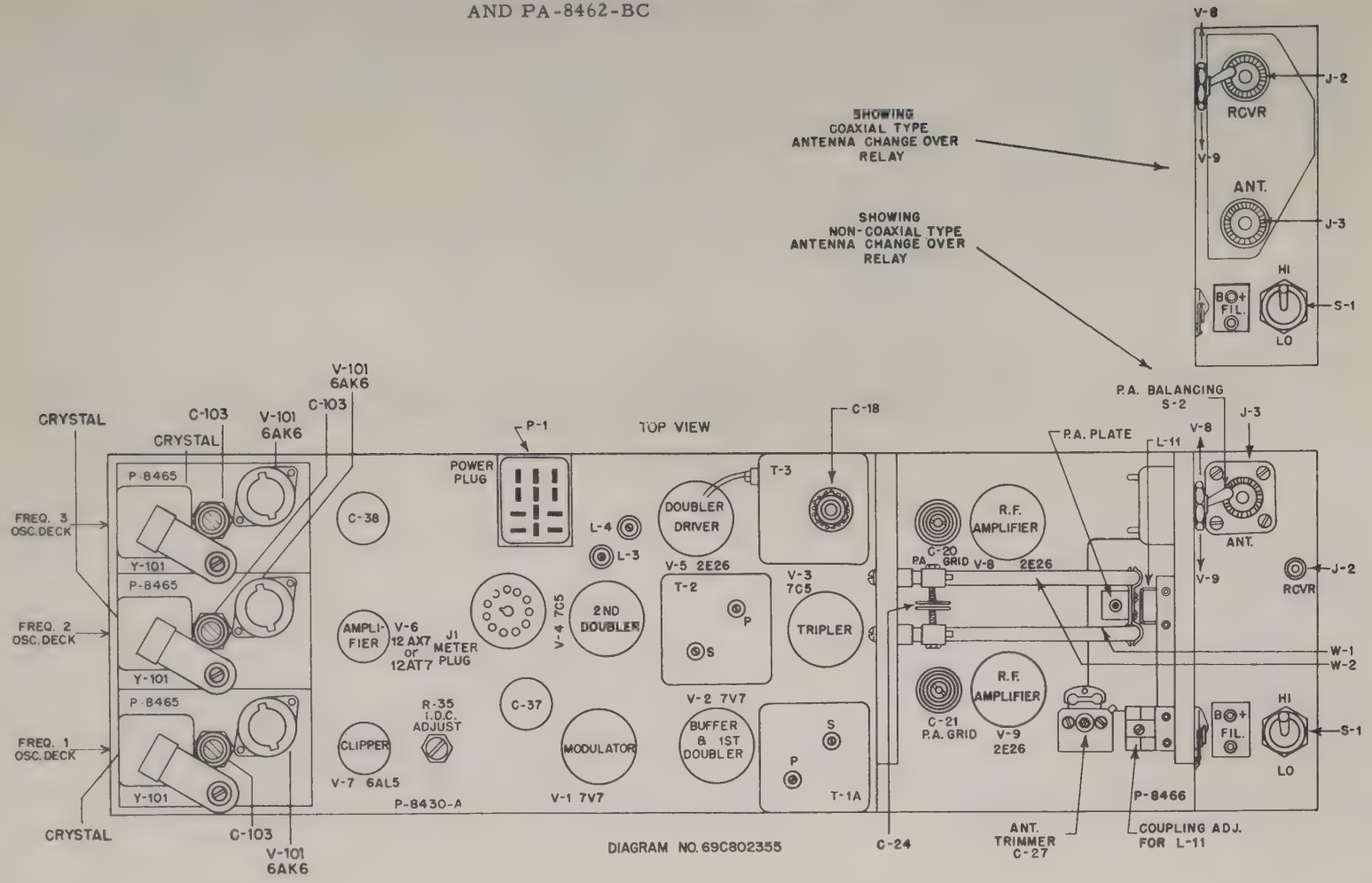
f_c = 152 TO 174 MEGACYCLES

MODEL DESCRIPTION
30 WATT TRANSMITTER WITH PRE-AMP

MODEL	CHANNELS	PRIMARY VOLTAGE
PA-8461-BP	1 FREQ.	117 VAC
PA-8462-BP	2 FREQ.	117 VAC
PA-8462-CP	2 FREQ.	117 VAC

DIAGRAM NO. 63C804354

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8461-B, PA-8462-B, PA-8463-B, PA-8461-C AND PA-8462-BC



MOTOROLA
PART NO. 69C802355
ISSUE - F 10/54-CP

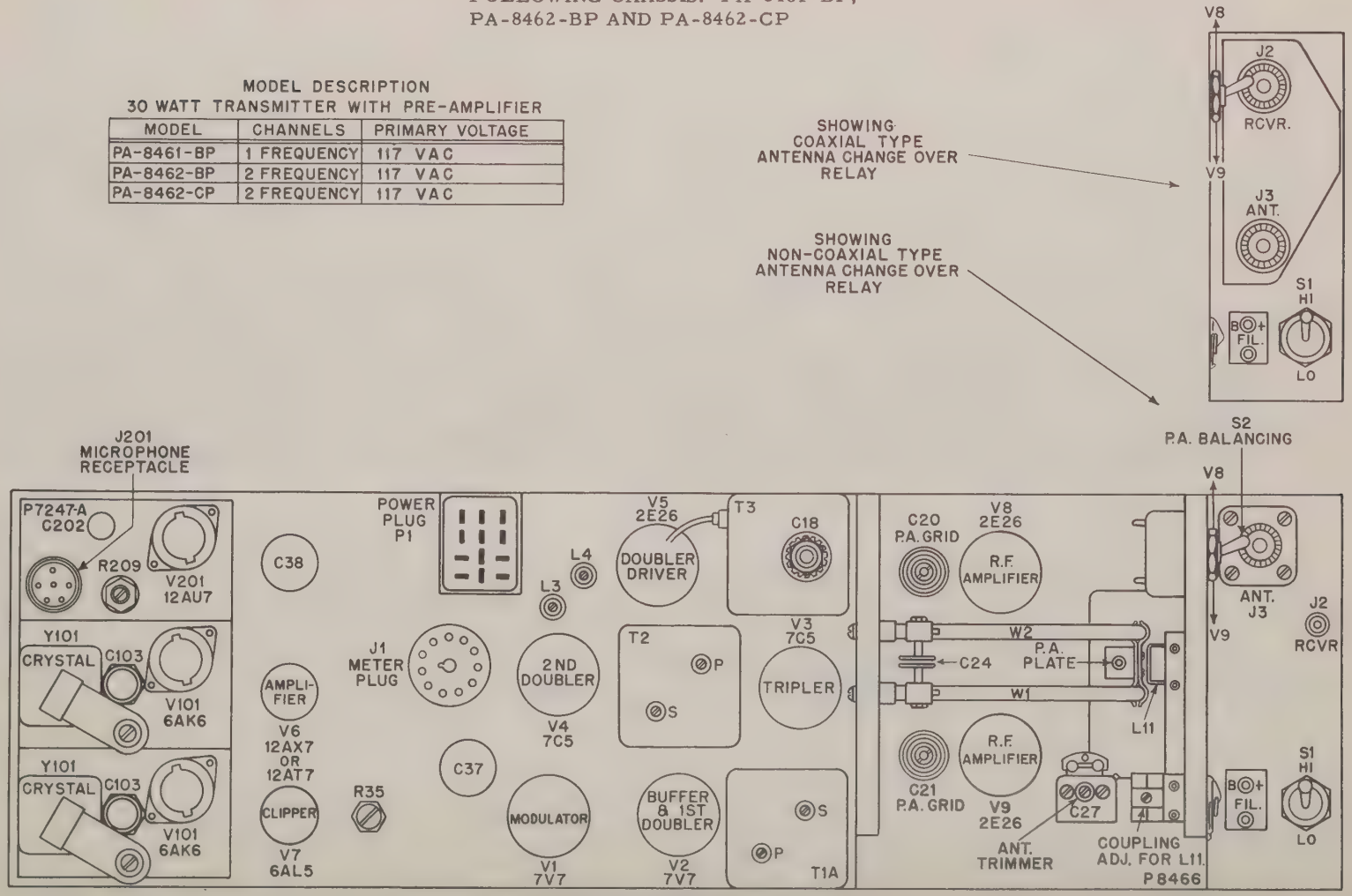
152-174 MC. 30 WATT TRANSMITTER CHASSIS
PARTS LOCATION DETAIL

152-174 MC. 30 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8461-BP, PA-8462-BP AND PA-8462-CP

MODEL DESCRIPTION
30 WATT TRANSMITTER WITH PRE-AMPLIFIER

MODEL	CHANNELS	PRIMARY VOLTAGE
PA-8461-BP	1 FREQUENCY	117 VAC
PA-8462-BP	2 FREQUENCY	117 VAC
PA-8462-CP	2 FREQUENCY	117 VAC

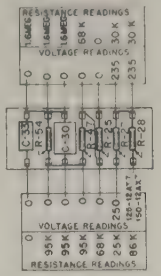


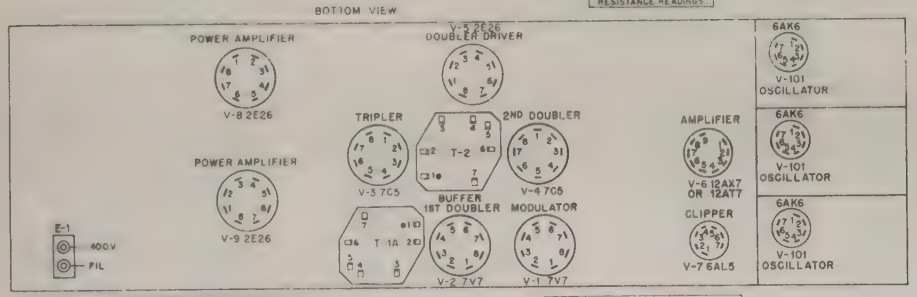
DETAIL NO. 69C804355

THIS DIAGRAM IS APPLICABLE TO THE
FOLLOWING CHASSIS: PA-8461-B,
PA-8462-B, PA-8463-B, PA-8461-C
AND PA-8462-BC

NOTES

1. ALL READINGS TAKEN AGAINST GROUND. VOLTAGE MEASUREMENTS TO BE MADE WITH A VACUUM TUBE VOLTMETER.
2. POWER PLUG AND METER PLUG DISCONNECTED FROM UNIT WHEN MEASURING RESISTANCE.
3. ALL VOLTAGES INDICATED OBTAINED WITH NOMINAL SUPPLY VOLTAGES (LO-B-250V HI-B-400V) AND NOMINAL POWER OUTPUT.
4. X READINGS TAKEN WITH 1 MEG RESISTOR IN SERIES WITH METER LEAD.
5. & [illegible]
6. FILAMENT VOLTAGE 6.3 OR 12.6 VAC OR VDC.
7. THIS READING VARIES WITH ADJUSTMENT OF R-36
8. Δ THIS VALUE IS 100 OHMS WHEN OSCILLATOR DECK IS WIRED OR SWITCHED IN. OTHERWISE READING IS ∞ (SEE SCHEMATIC AND INTERCABLING DIAGRAM)
9. Ω - MICROPHONE NOT IN CIRCUIT.
10. HI-LO SWITCH IN HI POSITION
11. EITHER A 12AX7 OR A 12AT7 MAY BE USED.
12. THREE FREQUENCY TRANSMITTER AVAILABLE ON SPECIAL ORDER ONLY.
13. ALL READINGS MAY VARY 20 % EXCEPT B+ WHICH MAY VARY 10 % .
14. ALL TUBES MUST BE IN PROPER SOCKETS





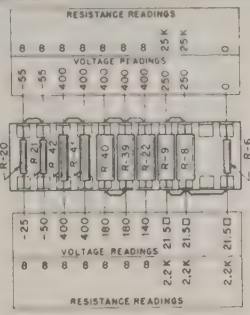
NOTE 11

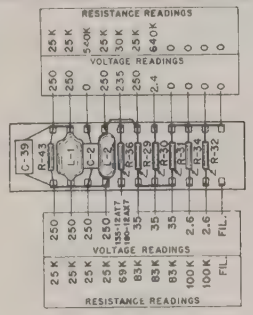
VOLTAGE

TUBE LEGEND	TUBE NO.	TUBE SOCKET PIN NUMBERS 1	2	3	4	5	6	7	8	9	CAP
6AK6 ⊕ OSC	V-101	-9	0	FIL	FIL	250	135	1.2	–	–	–
6AK6 + OSC	V-101	0	0	FIL	FIL	250	250	30.	–	–	–
6AK6 + OSC	V-101	0	0	FIL	FIL	250	250	30.	–	–	–
7V7 MOD.	V-1	FIL	250	250	250	0	0	10	FIL	–	–
7V7 1ST DOUBLER	V-2	FIL	225 X	100	0	0	-4	0	FIL	–	–
7C5 TRIPLER	V-3	FIL.	220 X	160	NC	250 M	-50 X	0	FIL	–	–
7C5 2ND DOUBLER	V-4	FIL.	230 X	180	250 M	250 M	-60 X	0	FIL	–	–
2E26 DBLR DRVR	V-5	0	FIL.	140	0	-60 X	0	FIL.	0	–	380 X
12AX7 AMPLIFIER	V-6	150	0	0.9	FIL.	FIL.	180	0	1.3	FIL	–
6AL5 CLIPPER	V-7	2.6	2.4	FIL	FIL	2.6	0	2.4	–	–	–
2E26 PWR AMP.	V-8	0	FIL.	190	0	-50 X	0	FIL.	0	–	380 X
2E26 PWR. AMP.	V-9	0	FIL.	190	0	-50 X	0	FIL.	0	–	380 X
12AT7 AMPLIFIER	V-6	125	0	1.4	FIL	FIL	155	0	2.6	FIL	

⊕ VALUES SHOWN FOR OSCILLATOR IN USE.
\+ VALUES SHOWN FOR OSCILLATOR NOT IN USE

TRANSFORMER N*	TRANSFORMER BASE PIN NUMBERS 1	2	3	4	5	6	7
T-1A	0	250	225X	-.7	0	-60	-50X
T-2	0	250	220X	-.9	0	-75	-60X





SEE NOTE 11

RESISTANCE

TUBE LEGEND	TUBE N*	TUBE SOCKET PIN NUMBERS 1	2	3	4	5	6	7	8	9	CAP
6AK6 OSC	V-101	47 K	0	FIL	FIL	25 K	93 K	100 Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL	FIL	25 K	93 K	100 Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL	FIL	25 K	93 K	100 Δ	–	–	–
7V7 MOD.	V-1	FIL.	25 K	25 K	25 K	0	540 K	1500	FIL	–	–
7V7 1ST DOUBLER	V-2	FIL.	26 K	125 K	0	0	470 K	0	FIL	–	–
7C5 TRIPLER	V-3	FIL	26 K	81 K	NC.	25 K M	270 K	0	FIL	–	–
7C5 2ND DOUBLER	V-4	FIL.	25 K	58 K	25 K M	25 K M	180 K	0	FIL	–	–
2E26 DBLR. DRVR.	V-5	0	FIL.	∞	0	∞	0	FIL	0	–	∞
12AX7 AMPLIFIER	V-6	86 K	68 K OR 90 K	560	FIL.	FIL.	69 K	NOTE 7	1000	FIL	–
6AL5 CLIPPER	V-7	100 K	640 K	FIL	FIL.	100 K	0	640 K	–	–	–
2E26 PWR AMP	V-8	0	FIL	∞	0	∞	0	FIL	0	–	∞
2E26 PWR AMP	V-9	0	FIL	∞	0	∞	0	FIL	0	–	∞
12AT7 AMPLIFIER	V-6	86 K	68 K OR 90 K	560	FIL.	FIL.	69 K	NOTE 7	1000	FIL	

TRANSFORMER N*	TRANSFORMER BASE PIN NUMBERS 1	2	3	4	5	6	7
T-1A	0	25K	26K	2700	0	270K	270K
T-2	0	25K	26K	1500	0	180K	180K

MOTOROLA
PART NO. 63D802356
ISSUE - K 10/54-CP

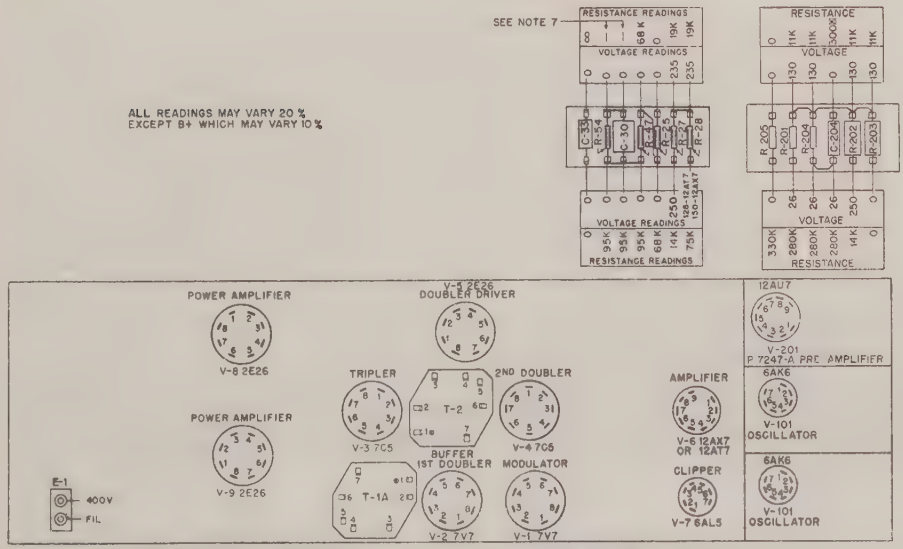
152-174 MC. 30 WATT TRANSMITTER CHASSIS
VOLTAGE AND RESISTANCE DIAGRAM

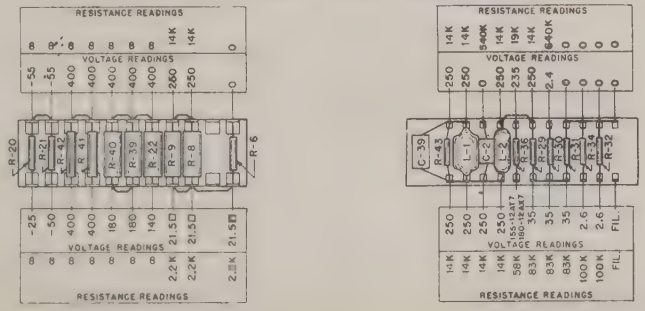
MOTOROLA
PART NO. 63D804356
ISSUE - E 10/54-CP

152-174 MC. 30 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER VOLTAGE AND RESISTANCE DIAGRAM

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8461-BP, PA-8462-BP AND PA-8462-CP

ALL READINGS MAY VARY 20 % EXCEPT B+ WHICH MAY VARY 10 %





VOLTAGE

TUBE LEGEND	TUBE NO	TUBE SOCKET PIN NUMBERS 1	2	3	4	5	6	7	8	9	CAP
6AK6 ⊕ OSC.	V-101	-9	0	FIL.	FIL.	250	135	1.2	–	–	–
6AK6 + OSC.	V-101	0	0	FIL.	FIL.	250	250	30.	–	–	–
12AU7 PRE-AMP	V-201	26	0	1.3	FIL.	FIL.	26	0	1.3	FIL.	–
7V7 MOD.	V-1	FIL.	250	250	250	0	0	10	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL.	225 X	100	0	0	-4	0	FIL.	–	–
7C5 TRIPLER	V-3	FIL.	220 X	160	NC.	250✱	-50 X	0	FIL.	–	–
7C5 2ND DOUBLER	V-4	FIL.	230 X	180	250✱	250✱	-60 X	0	FIL.	–	–
2E26 DBLR DRVR.	V-5	0	FIL.	140	0	-60 X	0	FIL.	0	–	380 X
12AX7 AMPLIFIER	V-6	150	0	0.9	FIL.	FIL.	180	0	1.3	FIL.	–
6AL5 CLIPPER	V-7	2.6	2.4	FIL.	FIL.	2.6	0	2.4	–	–	–
2E26 PWR AMP.	V-8	0	FIL.	190	0	-50 X	0	FIL.	0	–	380 X
2E26 PWR AMP.	V-9	0	FIL.	190	0	-50 X	0	FIL.	0	–	380 X
12AT7 AMPLIFIER	V-6	125	0	1.4	FIL.	FIL.	155	0	2.6	FIL.	

NOTE 8

⊕ VALUES SHOWN FOR OSCILLATOR IN USE.
+ VALUES SHOWN FOR OSCILLATOR NOT IN USE.

TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS 1	2	3	4	5	6	7
T-1A	0	250	225X	-.7	0	-60	-50 X
T-2	0	250	220X	-.9	0	-75	-60 X

VOLTAGE NOTES:

1. ALL READINGS TAKEN AGAINST GROUND. VOLTAGE MEASUREMENTS TO BE MADE WITH A VACUUM TUBE VOLTMETER.
2. ALL VOLTAGES INDICATED OBTAINED WITH NOMINAL SUPPLY VOLTAGES (LO-B-250V HI-B-400V) AND NOMINAL POWER OUTPUT.
3. XREADINGS TAKEN WITH 1 MEG RESISTOR IN SERIES WITH METER LEAD.
4. □-MICROPHONE NOT IN CIRCUIT.
5. FILAMENT VOLTAGE 6VAC OR DC.
6. HI-LO SWITCH IN HI POSITION.
7. ✱TIE POINT.
8. EITHER A 12AX7 OR A 12AT7 MAY BE USED.

RESISTANCE

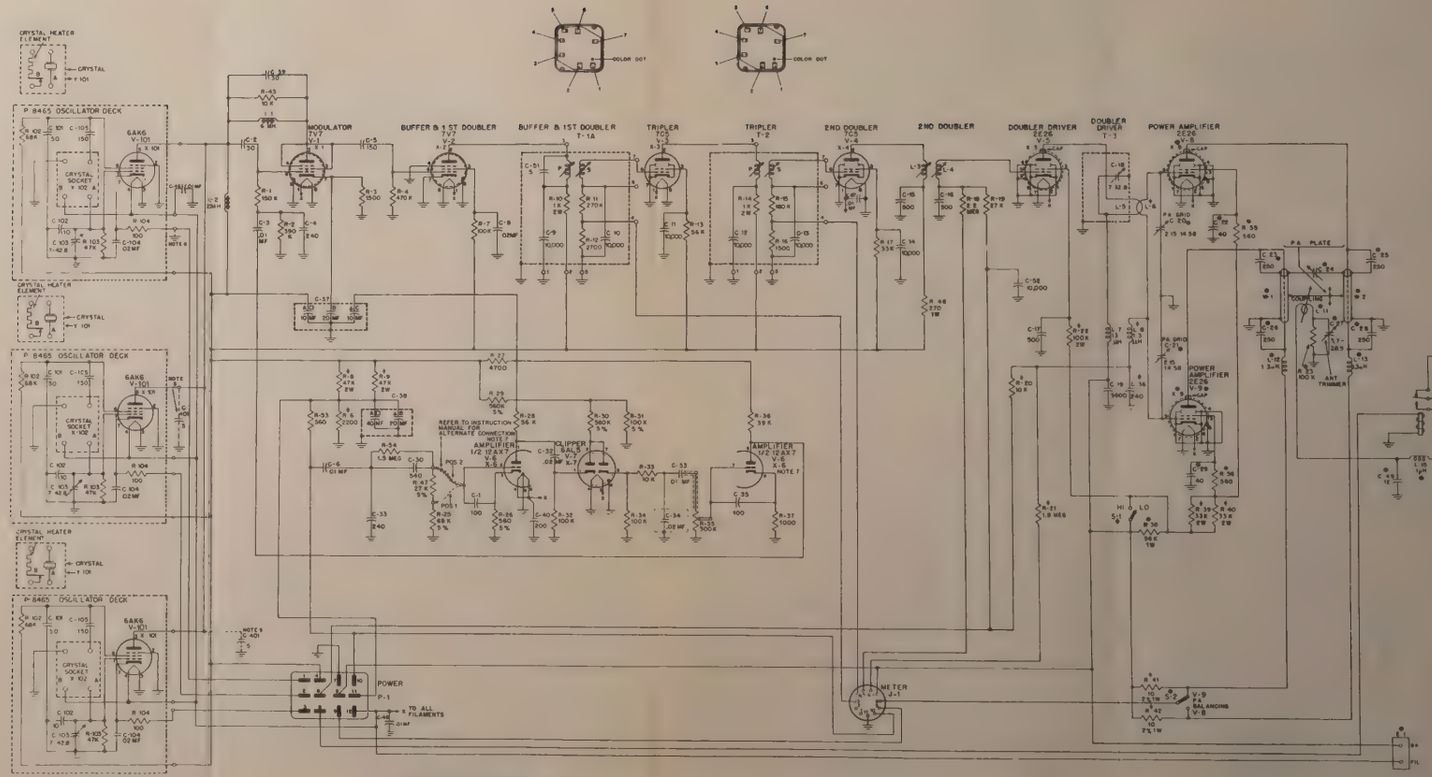
TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS 1	2	3	4	5	6	7	8	9	CAP
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	14 K	82K	100Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	14 K	82K	100Δ	–	–	–
12AU7 PRE-AMP	V-201	280 K	47 K	3.9K	FIL.	FIL.	280K	330K	3.9K	FIL.	–
7V7 MOD.	V-1	FIL.	14K	14 K	14 K	0	540 K	1500	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL.	15K	114 K	0	0	470 K	0	FIL.	–	–
7C5 TRIPLER	V-3	FIL.	15K	70 K	NC.	14K✱	270 K	0	FIL.	–	–
7C5 2ND DOUBLER	V-4	FIL.	14K	47K	14K✱	14K✱	180 K	0	FIL.	–	–
2E26 DBLR DRVR.	V-5	0	FIL.	∞	0	∞	0	FIL.	0	–	8
12AX7 AMPLIFIER	V-6	75 K	68K	560	FIL.	FIL.	58K	NOTE 4	1000	FIL.	8
6AL5 CLIPPER	V-7	100 K	640K	FIL.	FIL.	100 K	0	640 K	–	–	8
2E26 PWR AMP	V-8	0	FIL.	∞	0	∞	0	FIL.	0	–	8
2E26 PWR AMP.	V-9	0	FIL.	∞	0	∞	0	FIL.	0	–	8
SEE NOTE 6 12AT7 AMPLIFIER	V-6	75K	68K	560	FIL.	FIL.	58K	NOTE 4	1000	FIL.	

TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS 1	2	3	4	5	6	7
T-1A	0	14K	15K	3300	0	270K	270K
T-2	0	14K	15K	1800	0	180K	180K

RESISTANCE NOTES

1. ALL READINGS TAKEN AGAINST GROUND.
2. POWER PLUG AND METER PLUG DISCONNECTED FROM UNIT. ALL TUBES IN SOCKETS.
3. ✱TIE POINT.
4. THIS READING VARIES WITH ADJUSTMENT OF R-35.
5. Δ THIS VALUE IS 100 OHMS WHEN OSCILLATOR DECK IS WIRED OR SWITCHED IN. OTHERWISE READING IS ∞. (SEE SCHEMATIC AND INTERCABLING DIAGRAM)
6. EITHER A 12AX7 OR A 12AT7 MAY BE USED.
7. THIS READING VARIES WITH ADJUSTMENT OF R-209.

152-174 MC. 30 WATT TRANSMITTER CHASSIS SCHEMATIC DIAGRAM



MODEL DESCRIPTION 30 WATT TRANSMITTER

MODEL	CHANNELS	PRIMARY VOLTAGE	ANTENNA RELAY
PA 8461 B	1 FREQUENCY	6 VDC OR 117 V A.C.	NON-COAXIAL
PA 8465 B	2 FREQUENCY	6 VDC OR 117 V A.C.	NON-COAXIAL
PA 8465 B	3 FREQUENCY	6 VDC OR 117 V A.C.	NON-COAXIAL
PA 8465 C	3 FREQUENCY	6 VDC OR 117 V A.C.	COAXIAL

* THREE FREQUENCY TRANSMITTERS ARE ONLY APPLICABLE TO REMOTELY CONTROLLED INSTALLATIONS AND ARE AVAILABLE ON SPECIAL ORDER ONLY

NOTES
1. RESISTOR VALUES INDICATED IN OHMS UNLESS OTHERWISE STATED. K=1000 OHMS
2. CAPACITOR VALUES INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED MF=MICROFARADS
3. INDUCTANCE VALUES MH=MILLIHENRYS UH=MICROHENRYS
4. CONNECTORS SHOWN AS VIEWED FROM WIRING SIDE.
5. CAPACITOR C-107 X 8582 A BLANK OSC. DECK. SEE TABLE
6. GROUND CONNECTION USED ONLY FOR ONE FREQ. XMTR (PA-8461 B) AND IS REMOVED WHEN TWO OR MORE FREQ ARE USED
7. 1/2 6AT MAY BE REPLACED WITH 1/2 12AX7
8. C-54 & C-55 USED ON NON-COAXIAL RELAY MODELS ONLY SEE MODEL DESCRIPTION CHART

● INDICATES COMPONENTS WHICH ARE PART OF P-8466 OR P-8466 A RF OUTPUT DECK
◆ INDICATES COMPONENTS WHICH ARE PART OF P-8430-A BASIC CHASSIS
ALL OTHER COMPONENTS ARE PART OF P-8430-A BASIC CHASSIS

THIS SCHEMATIC DIAGRAM IS APPLICABLE AS SHOWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN THE TABLE BELOW. IT IS APPLICABLE TO EACH EARLIER PRODUCTION CHASSIS WHEN AMENDED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS

CHASSIS	DISCONTINUED VERSIONS	MODIFICATION SERVICE BULLETIN NUMBERS	LATEST VERSION
PA-8461 B	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	- 12
PA-8462 B	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	- 14
PA-8465 C	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	- 12
PA-8466 C	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	- 6
PA-8482 B	1 2 3 4 5 6 7	8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	- 7

MOTOROLA
PART NO. 63E802357
ISSUE - N 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., basic chassis, RF decks etc. When ordering replacement parts specify part number, description, schematic diagram number, diagram issue, and reference symbol of the part.

1. PA-8461-B, PA-8462-B, PA-8463-B, PA-8461-C, PA-8462-BC

Reference: Schematic Diagram 63E802357

a. P-8430-A Strip Transmitter Chassis (Basic)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	21R6631	Fixed: silver mica; 100 mmf ±10%; 500 vdcw
C 2	21R2733	Fixed: silver mica; 30 mmf ±10%; 500 vdcw
C 3	21A801139	Fixed: ceramic; disc; .01 mf +80-20%; 600 vdcw
C 4	21R6662	Fixed: mica; 240 mmf ±10%; 500 vdcw
C 5	21R2701	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
	or 21R6527	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
C 6		Same as C 3
C 7		NOT USED
C 8	21R401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 11		Same as C 3
C 14		Same as C 3
C 15	21A811306	Fixed: ceramic; 500 mmf ±10%; 500 vdcw
C 16		Same as C 15
C 17		Same as C 15
C 19	21K893343	Fixed: mica; 5000 mmf ±20%; 1000 vdcw
C 30	21K803505	Fixed: silver mica; 540 mmf ±3%; 500 vdcw
C 32		Same as C 8
C 33		Same as C 4
C 34	8K836754	Fixed: oil filled; tubular; .02 mf ±10%; 400 vdcw
C 35		Same as C 1
C 37	23K892117	Fixed: electrolytic; 3 section; consisting of:
C 37A		□10 mf +50-10%; 450 vdcw; section
C 37B		20 mf +100-10%; 25 vdcw, section
C 37C		△10 mf +50-10%; 450 vdcw; section
C 38	23K832217	Fixed: electrolytic; 2 section; consisting of:
C 38A		□40 mf +100-10%; 150 vdcw; section
C 38B		△20 mf +100-10%; 150 vdcw; section
C 39		Same as C 2
C 40	21R2748	Fixed: mica; 200 mmf ±10%; 500 vdcw
C 46		Same as C 3
C 47		Same as C 3
C 48		Same as C 3
C 52		Same as C 3
C 53		Same as C 3
		CONNECTOR,
J 1	9B86864	Receptacle: female; 11 contact; polarized; round; black plastic base; does not include 42A821428 RING, connector retainer; which must be ordered separately; METER

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		COILS,
L 1	24K483466	RF: choke; 6 millihenries
L 2	24A483465	RF: choke; 2 millihenries
L 7	24A891063	RF: choke; 1.3 microhenries
		CONNECTOR,
P 1	28A483376	Receptacle: male; 12 contact; polarized; rectangular; black phenolic base; saddle mounting; POWER
		RESISTORS,
R 1	6R6398	Fixed: carbon; 150,000 ohm ±10%; 1/2 w; ins.
R 2	6R5646	Fixed: carbon; 390,000 ohm ±10%; 1/2 w; ins.
R 3	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.
R 4	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 5		NOT USED
R 7	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 13	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.
R 17	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.
R 18	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 19	6R6434	Fixed: carbon; 27,000 ohm ±10%; 1/2 w; ins.
R 25	6R6479	Fixed: carbon; 68,000 ohm ±5%; 1/2 w; ins.
R 26	6R400058	Fixed: carbon; 560 ohm ±5%; 1/2 w; ins.
R 27	6R6080	Fixed: carbon; 4700 ohm ±10%; 1/2 w; ins.
R 28		Same as R 13
R 29	6R5796	Fixed: carbon; 560,000 ohm ±5%; 1/2 w; ins.
R 30		Same as R 29
R 31	6R5553	Fixed: carbon; 100,000 ohm ±5%; 1/2 w; ins.
R 32		Same as R 7
R 33	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 34		Same as R 7
R 35	18K892291	Variable: carbon; 300,000 ohm ±20%
R 36	6R6487	Fixed: carbon; 39,000 ohm ±10%; 1/2 w; ins.
R 37	6R6229	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins.
R 43		Same as R 33
R 47	6R5786	Fixed: carbon; 27,000 ohm ±5%; 1/2 w; ins.
R 48	6R6336	Fixed: carbon; 270 ohm ±10%; 1 w; ins.
R 53	6R6291	Fixed: carbon; 560 ohm ±10%; 1/2 w; ins.
R 54	6R6460	Fixed: carbon; 1.5 megohm ±10%; 1/2 w; ins.
		TUBES,
V 1	7V7	Electron
V 2		Same as V 1
V 3	7C5	Electron
V 4		Same as V 3
V 5	2E26	Electron
V 6	12AX7	Electron
	or 12AT7	Electron
V 7	6AL5	Electron
		SOCKETS,
X 1	9A83952	Tube: female; 8 contact; mica filled phenolic base; saddle mounting

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SOCKETS,
X 2		Same as X 1
X 3		Same as X 1
X 4		Same as X 1
X 5	9A890001	Tube: female; 8 contact; brown and tan bakelite wafer base; saddle mounting
X 6	9K832481	Tube: female; 9 contact; miniature; black phenolic base; saddle mounting; includes center shield and tube shield base
X 7	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base

b. K-8432 Coil Kit (p/o P-8430-A)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 9	21A801139	CAPACITORS, Fixed: ceramic; disc; .01 mf +80-20%; 600 vdcw; p/o T 1A
C 10		Same as C 9; p/o T 1A
C 12		Same as C 9 except p/o T 2
C 13		Same as C 9 except p/o T 2
C 18	19A475604	Variable: air; 7 mmf to 42.8 mmf; p/o T 3
C 51	21A813136	Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw; p/o T 1A
		COILS,
L 3	1V85835	RF: 2nd Doubler Plate
L 4	1V892523	RF: Doubler Driver Grid
L 5	24B483514	RF: Doubler Driver Plate; p/o T 3
		RESISTORS,
R 10	6R3922	Fixed: carbon; 1000 ohm ±10%; 2 w; ins.; p/o T 1A
R 11	6R6414	Fixed: carbon; 270,000 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 12	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 14		Same as R 10 except p/o T 2
R 15	6R6444	Fixed: carbon; 180,000 ohm ±10%; 1/2 w; ins.; p/o T 2
R 16	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.; p/o T 2
		COILS,
T 1A	24B813173	RF: Buffer and 1st Doubler
T 2	24B881294	RF: Tripler
T 3	1V880036	RF: Doubler Driver

c. P-8466 RF Output Deck (with non-coaxial relay)
P-8466-A RF Output Deck (with coaxial relay)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 20	19A475605	CAPACITORS, Variable: air; 2.15 mmf to 14.58 mmf; PA Grid
C 21		Same as C 20
C 22	21K474499	Fixed: silver mica; 40 mmf ±10%; 500 vdcw
C 23	1V483559	Fixed: silver mica; 250 mmf ±10%; 850 vdcw; includes terminal lug
C 24		Variable: air; consisting of: 51A483511 PLATE, capacitor; and screw (2 required for capacitance)
C 25		Same as C 23
C 26	1K84708	Fixed: silver mica; 250 mmf ±10%; 850 vdcw; includes terminal lug
C 27	19A84648	Variable: air; 3.7 mmf to 28.9 mmf; ANTENNA
C 28	1A84707	Fixed: silver mica; 250 mmf ±10%; 850 vdcw; includes terminal lug
C 29		Same as C 22
C 49	21K86555	Fixed: ceramic; 12 mmf ±.6 mmf; 500 vdcw
C 50		Same as C 49

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 54	21K474952	CAPACITORS, Fixed: ceramic; tubular; 4 mmf ±.5 mmf; 500 vdcw; used only in P-8466
C 55		Same as C 54; used only in P-8466
		BOARD,
E 1	31A890581	Terminal: 2 solder lug terminals
		CONNECTORS,
J 2	9A87120	Receptacle: female; single contact round; mica filled phenolic insulator; RECEIVER
J 3	9A85615	Receptacle: female; single contact; round; mica filled bakelite insulator; ANTENNA
		NOTE J 2 and J 3 replaceable as separate part only when using non-coaxial relay 59B800031.
		RELAY,
K 1	59B800031	Armature: non-coaxial; 6 vdc; contact arrangement; 1 form "C"; ANTENNA; used only on P-8466
	or 1V830199	Assembly: includes: 80B825612 RELAY, armature: non-coaxial; 6 vdc; contact arrangement; 1 form "C" 7A825613 BRACKET, relay mounting 3S121274 SCREW, machine: 3-48 x 1/8"; 4 supplied 4S7681 LOCKWASHER: #3 internal; 4 supplied (Assembly used only on P-8466)
	or 59C483605	Armature: coaxial; 6 volt; contact arrangement; 1 form "C"; ANTENNA; used only on P-8466-A
		COILS,
L 9		NOT USED
L 10		NOT USED
L 11	24A483487	RF: Antenna Coupling
L 12	24A891063	RF: choke; 1.3 microhenries
L 13		Same as L 12
L 14		NOT USED
L 15	24A801714	RF: Harmonic Filter; .1 microhenry
		RESISTORS,
R 23	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 24		NOT USED
R 38	6R6402	Fixed: carbon; 56,000 ohm ±10%; 1 w; ins.
R 55	6R6291	Fixed: carbon; 560 ohm ±10%; 1/2 w; ins.
R 56		Same as R 55
		SWITCHES,
S 1	40A482097	Toggle: S.P.S.T.; HI-LO
	or 40A811825	Toggle: S.P.S.T.; HI-LO
S 2	40A80248	Toggle: S.P.D.T.; PA Balancing
	or 40K811753	Toggle: S.P.D.T.; PA Balancing
		TUBE,
V 8	2E26	Electron
V 9		Same as V 8
		LINE,
W 1	1V880065	RF: Transmission
W 2		Same as W 1

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SOCKET,
X 8	9A890001	Tube: female; 8 contact; brown and tan bakelite wafer base; saddle mounting
X 9		Same as X 8

d. P-8465 Oscillator Deck

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 101	21K6553	CAPACITORS, Fixed: silver mica; 50 mmf ±10%; 500 vdcw
C 102	21K85882	Fixed: ceramic; 10 mmf ±.5 mmf 500 vdcw
C 103	19A475604	Variable: air; 7 mmf to 42.8 mmf
C 104	21K401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 105	21R2701	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
		RESISTORS,
R 101		NOT USED
R 102	6R6074	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins.
R 103	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 104	6R6326	Fixed: carbon; 100 ohm ±10%; 1/2 w; ins.
		TUBE,
V 101	6AK6	Electron
		SOCKETS,
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base
X 102	9A30451	Crystal: female; 4 contact; mica filled bakelite base

e. K-8582-A Blank Oscillator Chassis Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 401	21K86229	CAPACITOR, Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw

f. K-8468 Chassis Kit (30 watt)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 36	21R6662	CAPACITOR, Fixed: mica; 240 mmf ±10%; 500 vdcw
		COILS,
L 6	24A483516	RF: PA Grid
L 8	24A891063	RF: choke; 1.3 microhenries
		RESISTORS,
R 6	6R6069	Fixed: carbon; 2200 ohm ±10%; 1/2 w; ins.
R 8	6R5736	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 9		Same as R 8
R 20	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 21	6R488215	Fixed: carbon; 1.8 megohm ±10%; 1/2 w; ins.
R 22	6R2099	Fixed: carbon; 100,000 ohm ±10%; 2 w; ins.
R 39	6R5768	Fixed: carbon; 33,000 ohm ±10%; 2 w; ins.
R 40		Same as R 39
R 41	17K892516	Fixed: wire wound; 10 ohm ±2%; 1 w; ins.
	or 17K821902	Fixed: wire wound; 10 ohm ±2%; 3 w, ins.
R 42		Same as R 41

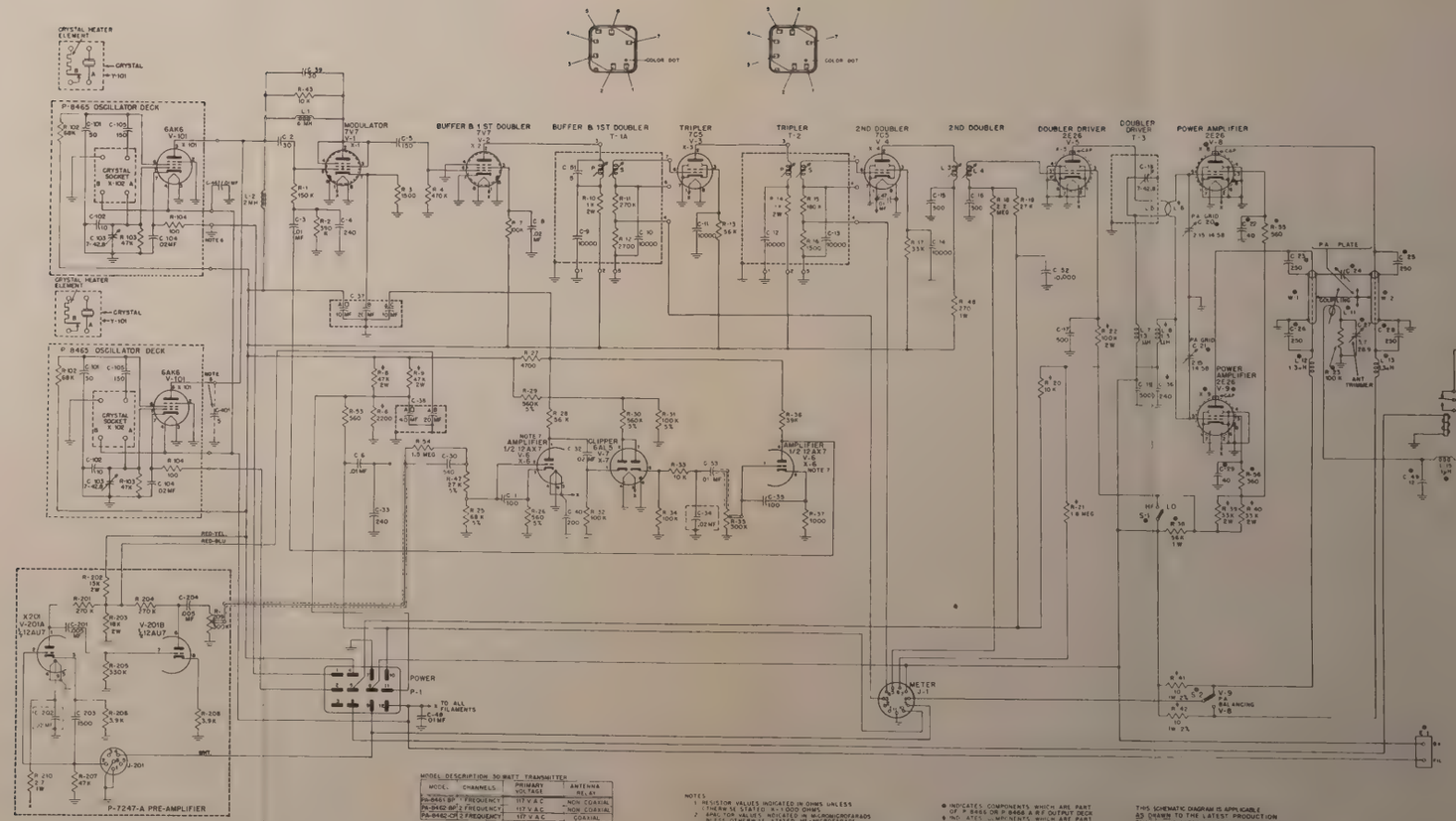
2. Crystal

NOTE

Crystal Unit is not part of transmitter unit, and must be ordered separately.

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
Y 101	1U801426	CRYSTAL UNIT, Quartz: oscillator transmitter; 6300-7200 kc.; MOTOROLA TYPE D03; with 6 volt heater unit; when ordering, frequency must be specified. Includes the following CRYSTAL REPLACEMENT PARTS: 1U801413 CRYSTAL UNIT, quartz: oscillator transmitter: 6300-7300 kc.; MOTOROLA TYPE B03; when ordering, frequency must be specified. 1U891880 HEATER & THERMOSTAT ASSEMBLY: MOTOROLA TYPE D0X: consisting of: 1V891886 HEATER and BASE ASSEMBLY 1C892365 THERMOSTAT, crystal unit or 1C837260 THERMOSTAT, crystal unit 15B891444 HOUSING, crystal, thermostat and heater 64A892473 PLATE, crystal unit baffle 41A891451 RING, crystal housing retainer

152-174 MC. 30 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER SCHEMATIC DIAGRAM



MODEL DESCRIPTION 30 WATT TRANSMITTER

MODEL	CHANNELS	PRIMARY VOLTAGE	ANTENNA RELAY
PA-8465 BP	FREQUENCY	117 V A C	NON COAXIAL
PA-8462 BP-2	FREQUENCY	117 V A C	NON COAXIAL
PA-8462 CP-2	FREQUENCY	117 V A C	COAXIAL

NOTES
1. RESISTOR VALUES INDICATED IN OHMS UNLESS OTHERWISE STATED. K = 1,000 OHMS.
2. CAPACITOR VALUES INDICATED IN MICROMICROFARADS (MMF) UNLESS INDICATED BY MF MICROFARADS
3. RESISTANCE VALUES NOMINAL, 1/2W RATED, ±10% MICROHMS WATTS.
4. CONNECTORS SHOWN AS VIEWED FROM WIRING SIDE
5. JUNCTION C-201, R-9387 & K-6344 OSC. DECK. SEE TABLE
6. GROUND CONNECTION USED ONLY FOR UNETCHED EMITRIM (PA-8461 BP) GROUND MUST BE REMOVED WHEN TWO OR MORE FREQ ARE USED
7. CLAMP MAY BE USED AT "CAT"
8. C-54 & C-55 USED ON NON COAXIAL RELAY MODELS ONLY SEE MODEL DESCRIPTION CHART

● INDICATES COMPONENTS WHICH ARE PART OF P-8466 OR P-8468 A RF OUTPUT DECK & IND. ATES COMPONENTS WHICH ARE PART OF P-8468 CHASSIS KIT
ALL OTHER COMPONENTS ARE PART OF P-8430 A BASIC CHASSIS

THIS SCHEMATIC DIAGRAM IS APPLICABLE AS SHOWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN THE TABLE BELOW. IT IS APPLICABLE TO EACH EARLIER PRODUCTION CHASSIS WHEN MODIFIED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS

MODIFYING SERVICE BULLETIN NUMBERS

CHASSIS DESIGNATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	LATEST SUFFIX
PA-8465 BP-	1	2	3	4	5	6	7	8	9	10	11								10
PA-8462 BP-	1	2	3	4	5	6	7	8	9	10	11								12
PA-8462 CP-	1	2	3	4	5	6	7	8	9	10	11								12

MOTOROLA
PART NO. 63E802344
ISSUE - M 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

NOTE

This equipment is assembled by kits, i.e., basic chassis, RF transmitter, Audio, modulator, schematic diagram number, part number, circuit board, schematic diagram issue, and reference symbol of the part.

Part number prefixes are as follows: P-for complete transmitter, K-for kits, and TP-for test probe.

Reference, Schematic Diagram 68P81044

a. P-8465-A Assembled Transmitter Chassis (Basic)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	21R[illegible]	Fixed: silver mica; 100 mmf ±10%; 500 vdcw
C 2	21R2733	Fixed: silver mica; 30 mmf ±10%; 500 vdcw
C 3	21A801139	Fixed: ceramic; disc; .01 mf +80-20%; 500 vdcw
C 4	21R6[illegible]	Fixed: mica; 240 mmf ±10%, 500 vdcw
C 5	21R2701	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
or	21R6627	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
C 6		Same as C 3
C 7		NOT USED
C 8	21R401029	Fixed: ceramic, disc, .02 mf +80-20%; 500 vdcw
C 11		Same as C 3
C 14		Same as C 3
C 15	21A881306	Fixed: ceramic; 500 mmf ±10%; 500 vdcw
C 16		Same as C 15
C 17		Same as C 15
C 19	21R803343	Fixed: mica, 5000 mmf ±20%; 1000 vdcw
C 30	21R803605	Fixed: silver mica, 540 mmf ±3%; 500 vdcw
C 32		Same as C 8
C 33		Same as C 4
C 34	8K836754	Fixed: oil filled; tubular; .02 mf ±10%, 400 vdcw
C 35		Same as C 1
C 37	23K892147	Fixed: electrolytic, 3 section; consisting of:
C 37A		□10 mf +50-10%; 450 vdcw; section
C 37B		.20 mf +100-10%, 25 vdcw; section
C 37C		Δ10 mf +50-10%, 450 vdcw, section
C 38	23K832217	Fixed: electrolytic; 2 section; consisting of:
C 38A		□40 mf +100-10%; 150 vdcw; section
C 38B		Δ20 mf +100-10%; 150 vdcw; section
C 39		Same as C 2
C 40	21R2748	Fixed: mica; 200 mmf ±10%; 500 vdcw
C 46		Same as C 3
C 47		Same as C 3
C 48		Same as C 3
C 52		Same as C 3
C 53		Same as C 3
		CONNECTOR,
J 1	9B86864	Receptacle: female; 11 contact; polarized, round; black plastic base; does not include 42A821428 RING, connector; retainer; which must be ordered separately; METER

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		COILS,
L 1	24K483466	RF: choke, 6 millihenries
L 2	24A483465	RF choke, 2 millihenries
L 7	24A891063	RF: choke; 1.3 microhenries
		CONNECTOR,
P 1	28A483376	Receptacle: male; 12 contact; polarized; rectangular; black phenolic base; saddle mounting; POWER
		RESISTORS,
R 1	6R6398	Fixed: carbon; 150,000 ohm ±10%; 1/2 w, ins.
R 2	6R5646	Fixed: carbon; 390,000 ohm ±10%; 1/2 w; ins.
R 3	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.
R 4	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 5		NOT USED
R 6	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 13	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.
R 17	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.
R 18	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 19	6R6434	Fixed; carbon; 27,000 ohm ±10%; 1/2 w; ins.
R 25	6R6479	Fixed: carbon; 68,000 ohm ±5%; 1/2 w; ins.
R 26	6R400058	Fixed: carbon; 560 ohm ±5%; 1/2 w; ins.
R 27	6R6080	Fixed: carbon; 4700 ohm ±10%; 1/2 w; ins.,
R 28		Same as R 13
R 29	6R5796	Fixed: carbon; 560,000 ohm ±5%; 1/2 w; ins.
R 30		Same as R 29
R 31	6R5553	Fixed: carbon; 100,000 ohm ±5%; 1/2 w; ins,
R 32		Same as R 7
R 33	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins,
R 34		Same as R 7
R 35	18K892291	Variable: carbon; 300,000 ohm ±20%
R 36	6R6481	Fixed: carbon; 39,000 ohm ±10%; 1/2 w; ins,
R 37	6R6229	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins.
R 43		Same as R 33
R 47	6R5786	Fixed: carbon; 27,000 ohm ±5%, 1/2 w; ins.
R 48	6R6336	Fixed: carbon; 270 ohm ±10%; 1 w; ins.
R 53	6R6291	Fixed: carbon; 560 ohm ±10%; 1/2 w; ins.
R 54	6R6460	Fixed: carbon; 1.5 megohm ±10%; 1/2 w; ins.
		TUBES,
V 1	7V7	Electron
V 2		Same as V 1
V 3	7C5	Electron
V 4		Same as V 3
V 5	2E26	Electron
V 6	12AX7	Electron
or	12AT7	Electron
V 7	6AL5	Electron
		SOCKETS,
X 1	9A83952	Tube: female; 8 contact; mica filled phenolic base; saddle mounting
X 2		Same as X 1

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SOCKETS,
X 3		Same as X 1
X 4		Same as X 1
X 5	9A890001	Tube: female; 8 contact; brown and tan bakelite wafer base; saddle mounting;
X 6	9K832481	Tube: female; 9 contact; miniature, black phenolic base, saddle mounting; includes center shield and tube shield base
X 7	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base

b. K-8432 Coil Kit (p/o P-8430-A)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 9	21A801139	Fixed: ceramic; disc; .01 mf +80-20%; 600 vdcw; p/o T 1A
C 10		Same as C 9; p/o T 1A
C 11		Same as C 9 except p/o T 2
C 13		Same as C 9 except p/o T 2
C 18	19A475604	Variable: air; 7 mmf to 42.8 mmf p/o T 3
C 51	21A813136	Fixed: ceramic, 5 mmf ±.5 mmf, 500 vdcw, p/o T 1A
		COILS,
L 3	1V85835	RF: 2nd Doubler Plate
L 4	1V892523	RF: Doubler Driver Grid
L 5	24B483514	RF: Doubler Driver Plate, p/o T 3
		RESISTORS,
R 10	6R3922	Fixed: carbon, 1000 ohm ±10%; 2 w; ins.; p/o T 1A
R 11	6R6414	Fixed: carbon; 270,000 ohm ±10%; 1/2 w; ins., p/o T 1A
R 12	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 14		Same as R 10 except p/o T 2
R 15	6R6444	Fixed: carbon, 180,000 ohm ±10%; 1/2 w, ins.; p/o T 2
R 16	6R6038	Fixed: carbon, 1500 ohm ±10%; 1/2 w; ins.; p/o T 2
		COILS,
T 1A	24B813173	RF: Buffer and 1st Doubler
T 2	24B881294	RF: Tripler
T 3	1V880036	RF: Doubler Driver

c. P-8466 RF Output Deck (with non-coaxial relay)
P-8466-A RF Output Deck (with coaxial relay)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 20	19A475605	Variable: air; 2.15 mmf to 14.58 mmf, PA Grid
C 21		Same as C 20
C 22	21K474499	Fixed: silver mica; 40 mmf ±10%; 500 vdcw
C 23	1V483559	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 24		Variable: air; consisting of: 51A483511 PLATE, capacitor; and screw (2 required for capacitance)
C 25		Same as C 23
C 26	1K84708	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 27	19A84648	Variable; air; 3.7 mmf to 28.9 mmf; ANTENNA
C 28	1A84707	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 29		Same as C 22
C 49	21K86555	Fixed: ceramic; tubular; 12 mmf ±.6 mmf; 500 vdcw
C 50		Same as C 49
C 54	21K474952	Fixed: ceramic; tubular; 4 mmf ±.5 mmf; 500 vdcw; used only in P-8466

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 55		CAPACITOR, Same as C 54; used only in P-8466
E 1	31A890581	BOARD, Terminal; 2 solder lug terminals
J 2	9A87120	CONNECTORS, Receptacle: female; single contact round; mica filled phenolic insulator; RECEIVER
J 3	9A85615	Receptacle: female; single contact; round; mica filled bakelite insulator; ANTENNA
		NOTE J 2 and J 3 replaceable as separate part only when using non-coaxial relay 59B800031.
K 1	59B800031	RELAY, Armature: non-coaxial; 6 vdc; contact arrangement; 1 form "C"; ANTENNA; used only on P-8466
or	1V830199	Assembly: Includes: 80B825612 RELAY, armature; non-coaxial; 6 vdc; contact arrangement; 1 form "C" 7A825613 BRACKET, relay mounting 15121274 SCREW, machine; 3-48 x 1/8", 4 supplied 4S7681 LOCKWASHER: #3 internal; 4 supplied (Assembly used only on P-8466)
or	59C483605	Armature: coaxial; 6 volt; contact arrangement; 1 form "C"; ANTENNA; used only on P-8466-A
L 9		COILS, NOT USED
L 10		NOT USED
L 11	24A483487	RF: Antenna Coupling
L 12	24A891063	RF: choke; 1.3 microhenries
L 13		Same as L 12
L 14		NOT USED
L 15	24A801714	RF: Harmonic Filter; .1 microhenry
R 23	6R6031	RESISTORS, Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 24		NOT USED
R 38	6R6402	Fixed: carbon; 56,000 ohm ±10%; 1 w; ins.
R 55	6R6291	Fixed:, carbon; 560 ohm ±10%; 1/2 w; ins.
R 56		Same as R 55
S 1	40A482097	SWITCHES, Toggle: S.P.S.T.; HI-LO
or	40A811825	Toggle: S.P.S.T.; HI-LO
S 2	40A80248	Toggle: S.P.D.T.; PA Balancing
or	40K811753	Toggle: S.P.D.T.; PA Balancing
V 8	2E26	TUBE, Electron
V 9		Same as V 8
W 1	1V880065	LINE, RF: Transmission
W 2		Same as W 1
X 8	9A890001	SOCKETS, Tube: female; 8 contact; brown and tan bakelite wafer base; saddle mtg
X 9		Same as X 8

d. P-8465 Oscillator Deck

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 101	21K6553	Fixed: silver mica; 50 mmf ±10%; 500 vdcw
C 102	21K85882	Fixed: ceramic; 10 mmf ±.5 mmf; 500 vdcw
C 103	19A475604	Variable: air; 7 mmf to 42.8 mmf
C 104	21K401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 105	21R2701	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
		RESISTORS,
R 101		NOT USED
R 102	6R6074	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins.
R 103	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 104	6R6326	Fixed: carbon; 100 ohm ±10%, 1/2 w; ins.
		TUBE,
V 101	6AK6	Electron
		SOCKETS,
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base, saddle mounting; includes center shield and tube shield base
X 102	9A830451	Crystal: female, 4 contact, mica filled bakelite base

e. K-8582-A Blank Oscillator Chassis Kit

C 401	21K86229	CAPACITOR, Fixed: ceramic, 5 mmf ±.5 mmf, 500 vdcw

f. K-8468 Chassis Kit (30 watt)

C 36	21K6662	CAPACITOR, Fixed: mica, 240 mmf ±10%, 500 vdcw
L 6	24A483516	COILS, RF: PA Grid
L 8	24A8910b3	RF: choke; 1.3 microhenries
R 6	6R6069	RESISTORS, Fixed: carbon; 2200 ohm ±10%, 1/2 w; ins.
R 8	6R5736	Fixed: carbon; 47,000 ohm ±10%; 1/2 w, ins.
R 9		Same as R 8
R 20	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 21	6R488215	Fixed: carbon; 1.8 megohm ±10%; 1/2 w; ins.
R 22	6R2099	Fixed: carbon; 100,000 ohm ±10%; 2 w; ins.
R 39	6R5768	Fixed: carbon; 33,000 ohm ±10%; 2 w; ins.
R 40		Same as R 39
R 41	17K892516	Fixed: wire wound; 10 ohm ±2%; 1 w; ins.
	or 17K821902	Fixed: wire wound; 10 ohm ±2%. 3 w; ins.
R 42		Same as R 41

g. P-7247-A Pre-Amplifier

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 201	21R115312	Fixed: ceramic, disc, .005 mf min, +100 max.; 500 vdcw
C 202	8K85984	Fixed: oil filled; .02 mf ±20%; 400 vdcw; tubular
C 203	21B800801	Fixed: ceramic, disc, .0015 mf CMV +100% max., 500 vdcw
C 204		Same as C 201
		CONNECTOR,
J 201	9A881071	Receptacle: Female; 6 contact; polarized; round, black phenolic insulator
		RESISTORS,
R 201	6R6414	Fixed: carbon; 270,000 ohm ±10%, 1/2 w, ins.
R 202	6R5732	Fixed: carbon; 15,000 ohm ±10%; 2 w; ins.
R 203	6R476014	Fixed: carbon, 18,000 ohm ±10%, 2 w; ins.
R 204		Same as R 201
R 205	6R2096	Fixed: carbon, 330,000 ohm ±10%, 1/2 w, ins,
R 206	6R5659	Fixed: carbon; 3900 ohm ±10%, 1/2 w; ins,
R 207	6R6048	Fixed: carbon; 47,000 ohm ±10%, 1/2 w, ins.
R 208		Same as R 206
R 209	18A893454	Variable: carbon, 300,000 ohm ±20%, 1/4 w
R 210	17A890468	Fixed: wire wound, 2.7 ohm ±10%, 1 w, ins.
		TUBE,
V 201	12AU7	Electron
		SOCKET,
X 201	9B881243	Tube: female, 9 contact miniature, mica filled base, saddle mounting, includes center shield and tube shield base

2. Crystal

NOTE

Crystal Unit is not part of transmitter unit, and must be ordered separately.

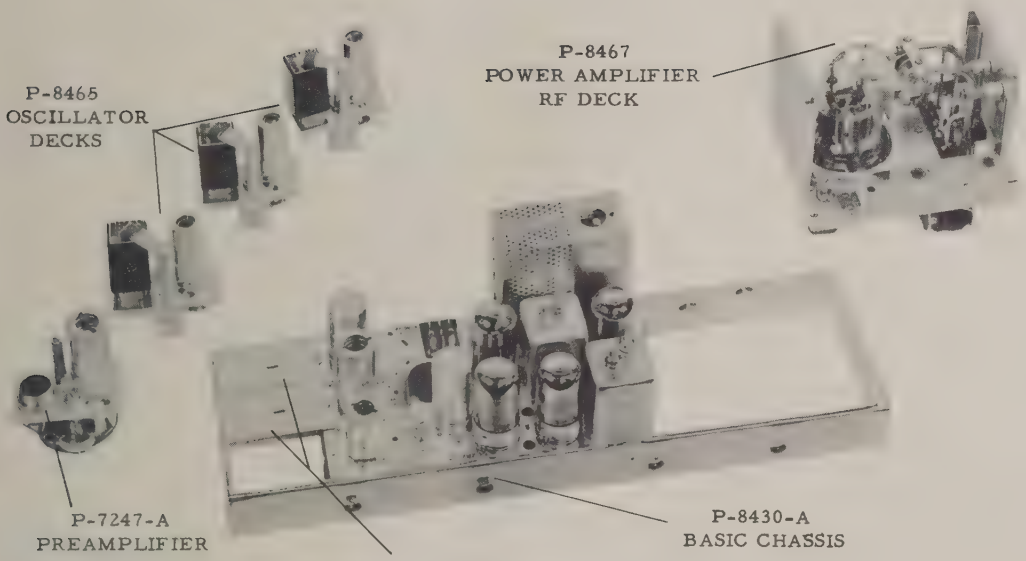
Y 101	1U801426	CRYSTAL UNIT, Quartz: oscillator transmitter, 6300-7300 kc.; MOTOROLA TYPE D03, with 6 volt heater unit, when ordering, frequency must be specified. Includes the following CRYSTAL REPLACEMENT PARTS: 1U801413 CRYSTAL UNIT, quartz; oscillator transmitter: 6300 - 7300 kc., MOTOROLA TYPE B03 when ordering frequency must be specified. 1U891880 HEATER and THERMOSTAT ASSEMBLY: MOTOROLA TYPE D0X; consisting of: 1V891886 HEATER and BASE ASSEMBLY 1C8923b5 THERMOSTAT, crystal unit or 1C837260 THERMOSTAT, crystal unit 15B891444 HOUSING, crystal, thermostat and heater 64A892473 PLATE, crystal unit, baffle 41A891451 RING, crystal housing retainer

Motorola®

THE "RESEARCH" LINE

60 WATT TRANSMITTER CHASSIS

152-174 MC. BASE STATION



CHASSIS	DESCRIPTION
PA-8491-B	Single-Frequency
PA-8492-B	Two-Frequency
PA-8493-B	Three-Frequency
PA-8491-BP	Single-Frequency with microphone pre-amplifier
PA-8492-BP	Two-Frequency with microphone pre-amplifier

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NOMINAL PERFORMANCE SPECIFICATIONS

BASIC UNIT	PA-8491-B, PA-8492-B, PA-8493-B, PA-8491-BP & PA-8492-BP
FREQUENCY	152-174 MC.
CRYSTAL FREQUENCY MULTIPLICATION	Twenty-Four (24)
NOMINAL RF POWER OUTPUT	60 watts, 152-167 MC. 50 watts, 167-174 MC.
POWER SOURCE	Separate power supply. 6.3 volt heater circuit.
SPURIOUS EMISSION	All spurious emissions are attenuated at least 70 db below carrier level. All harmonic radiations are suppressed 60 db. or more.
FREQUENCY STABILITY AND TEMPERATURE RANGE	Using an oven type crystal the carrier is maintained to within ±1 kc. of assigned center frequency or approximately ±.0006% over the ambient temperature range -30°C. to +60°C. (+25°C. reference).
MODULATION	40F3: ±15 kc. for 100% at 1000 cycles
AUDIO INPUT LEVEL	*500 ohm Control Line or Handset: Remote Control — 0.18 volts for 100% at 1000 cycles (approximately -20 db.) Magnetic Mic. ("Suffix P" Units Only): Local Control — 0.01 volts for 100% at 1000 cycles (approximately -60 db.) *Military Mic. (Cannot be used with "Suffix P" Units): Local Test — 0.25 volts for 100% at 1000 cycles (approximately -17 db.)
PLATE POWER SUPPLY	Separate Unit: 620 volts at 290 ma. 250 volts at 80 ma.
TUBE COMPLEMENT AND FUNCTION	(1) 6AK6 - RF Oscillator (1-Freq.) (2) 6AK6 - RF Oscillator (2-Freq.) (3) 6AK6 - RF Oscillator (3-Freq.) 7V7 - Modulator 7V7 - Buffer - 1st Doubler 7C5 - Tripler 7C5 - 2nd Doubler 2E26 - Doubler-Driver 829B - Final Amplifier 12AX7 or 12AT7 - I.D.C. Amplifier 6AL5 - I.D.C. Limiter 12AU7 - Pre-Amplifier ("Suffix P" Units Only)
NUMBER OF TUNED CIRCUITS	11 tuned circuits following the modulator including 3 double permeability-tuned transformer-coupled multiplier circuits, a series tuned doubler-driver transformer and a multiple tuned output network.
NOMINAL POWER INPUT (TOTAL)	Standby: 70 watts Transmit: 445 watts
DIMENSIONS	16-1/2" long x 4-7/8" wide x 5-1/2" high
WEIGHT	Approximately 7 lbs.

*Measured in series with 40 ohm equivalent resistance.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

1. DESCRIPTION

The basic MOTOROLA 60 watt, 152-174 megacycle transmitter is a 9 tube, single frequency transmitter for operation from a separate power supply. Except for the addition of one or two oscillator decks, the two and three-frequency transmitters are identical to the basic single frequency version. Transmitter chassis with "Suffix P" designations are identical to corresponding standard models with the exception that a P-7247-A Microphone Pre-Amplifier is added in place of one of the K-8582-A Blank Oscillator Decks. Refer to the chassis complement paragraph for specific variations.

Multi-channel transmitters are available with maximum frequency separations of ±200 kc. from circuit resonance without degradation of single frequency nominal performance specifications. Two-frequency transmitter chassis with frequency separations less than 200 kc. are normally phased at the factory on the higher of the two frequencies employed. In specific cases where channel separations exceed these limitations and where one channel is used much more frequently than the other, the transmitter may be aligned on the primary frequency (frequency most often used). Three-frequency transmitters may be phased at the mid-frequency (F 2) with the end frequencies (F 1 and F 3) having a maximum allowable separation of 120 kc. on either side. By this method, a maximum overall separation of 400 kc. is allowed without degradation of signal frequency nominal performance specifications.

The transmitter circuit incorporates a crystal controlled oscillator, a single angular phase modulator controlled by the MOTOROLA I.D.C. "INSTANTANEOUS DEVIATION CONTROL" circuit, four frequency multipliers and a push-pull final amplifier circuit.

The MOTOROLA I.D.C. "INSTANTANEOUS DEVIATION CONTROL" circuit is an integral part of the transmitter. This circuit limits the modulation deviation of 100% under all conditions. It is instantaneous in action while controlling the steepness of the modulating wave introduced into the angular modulator. It also prevents receiver distortion, loss of intelligibility and decrease in the signal-to-noise ratio which is due to excess modulation deviation.

All of the transmitter operating voltages are supplied from a separate power supply chassis.

2. CHASSIS COMPLEMENT

a. PA-8491-B

The PA-8491-B is a single frequency 60 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(1)	P-8465	Oscillator Deck
(2)	K-8582-A	Blank Oscillator Decks
(1)	P-8467	Power Amplifier RF Deck
(1)	K-8469	Chassis Kit

b. PA-8492-B

The PA-8492-B is a two-frequency 60 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(2)	P-8465	Oscillator Decks
(1)	K-8582-A	Blank Oscillator Deck
(1)	P-8467	Power Amp. RF Deck
(1)	K-8469	Chassis Kit

c. PA-8493-B

The PA-8493-B is a three-frequency 60 watt transmitter composed of:

(1)	P-8430-A	Basic Chassis includes K-8432 Coil Kit
(3)	P-8465	Oscillator Decks
(1)	P-8467	Power Amp. RF Deck
(1)	K-8469	Chassis Kit

NOTE

Three-frequency transmitters are available on special order only.

d. PA-8491-BP and PA-8492-BP

The MOTOROLA "Suffix P" versions of the PA-8491-B and PA-8492-B unit employ a P-7247-A Microphone Pre-Amplifier Unit mounted in the position which is provided for the third-crystal oscillator deck. These models are available for locally controlled "BL" and "BY" station equipment. The incorporation of this pre-amplifier permits the use of a dynamic or magnetic microphone such as the MOTOROLA P-274-F Dynamic, and P-7245 or P-7245-D "Magnamike" microphones.

3. PRE-ALIGNMENT NOTES

The transmitter was tuned and adjusted for its exact operating frequency prior to shipment from the factory. Unless it has been handled roughly while in transit or otherwise abused or tampered with, it should require no further adjustment before placing it in service other than to align the final RF amplifier stage to the antenna. If, for any reason, it becomes necessary for the transmitter to be retuned, the following instructions outline the correct procedure.

Meter readings will vary with a change in AC line voltage and will decrease with an increase in the life of the tubes and other components of the transmitter. Each time the transmitter is aligned or tested, the readings should be entered in a logbook.

IMPORTANT

It is illegal for anyone to tune or adjust a radio transmitter, except under direct supervision of a licensed radio operator who must hold a Radio-Telephone license of applicable class.

a. Equipment Necessary for Alignment

(1) Alignment Meters

(a) Complete metering facilities for transmitter alignment and checking have been provided in the MOTOROLA "BR", "BL", "BYR" and "BY" cabinets.

References to meter selector switch positions in the alignment procedure to follow are for fixed-station metering as well as for MOTOROLA Portable Test Set measurement.

NOTE

The selector switch should be kept in the positions designated "T" for "in-place" transmitter metering of "BY" and "BYR" models.

(b) The MOTOROLA P-8501-A Test Set may be utilized for bench alignment and metering of base station transmitters.

The MOTOROLA P-8501-A Test Set is designed and engineered for use with MOTOROLA "RESEARCH" Line equipment. Simplified meter switching, an expanded meter range, a 455 kc. crystal, and two crystal sockets have made the P-8501-A Test Set a universal instrument for the testing of MOTOROLA transmitters and receivers.

Early versions of the MOTOROLA Portable Test Sets may be used for alignment of "RESEARCH" Line equipment with only slight modifications in the alignment procedure outlined for the P-8501-A Test Set.

(2) Meter for Audio Adjustment - Vacuum tube voltmeter or other suitable 0-2.5 volt scale DC meter (Simpson Model 260 or equivalent).

(3) Alignment Tools, Part Nos. 66A891487 and 66A891488.

(4) Power Supply - Preferably one designed for the transmitter under test. When bench testing, jumper terminals 21 and 16 on the P-8434 or P-8464 Power Supply.

(5) Dummy Antennas

(a) Bird RF Wattmeter

(b) P-7208 RF Dummy Load for use with the P-8501-A Test Set.

(c) Lamp Dummy Antenna. Refer to Dummy Antenna Load Construction Detail (Part Number 69A880390).

b. Connection for Test Meter

(1) In-place alignment using fixed-station metering equipment.

(a) "BR" or "BL" Models

Insert the miniature 2-pin meter plug into the TRANSMITTER receptacle below the selector switch on the P-8449-B or P-8449-C Meter Switching Panel Chassis.

NOTE

Be sure the 11-conductor metering cable is properly connected to both the metering panel chassis and to the transmitter chassis.

(b) "BY" or "BYR" Models

Be sure the 11-pin connector on the end of the transmitter metering cable (p/o K-8677 or K-8689 Series Metering Kits) is plugged into the METER receptacle on the transmitter chassis.

(2) Bench Alignment Using Portable Test Set

(a) Place the REC-XMTR-0-50 switch in the XMTR position.

(b) Place the GRID CURRENT-METER-FIELD STRENGTH switch in the METER position.

(c) Use the XMTR ON switch to turn "on" the transmitter during alignment.

NOTE

Transmitter plate voltage is measured in selector switch position #7 on the P-8501-A Test Set.

c. Miscellaneous

(1) C 103 located on the P-8465 Oscillator Deck is preset and sealed at the factory. THE SETTING SHOULD NOT BE CHANGED IN THE FIELD. Should it be accidentally changed or if the crystal is changed, check with an approved Station Monitor (MOTOROLA F4MU-24B Series) and only then adjust C 103 to the specified frequency. The setting should then be resealed.

(2) Adjustment screws on T 1A, T 2, L 3 and L 4 have hexhead locknuts which must be loosened before the screws can be adjusted. They should be re-tightened only by hand. Care should be taken not to disturb the screw settings when tightening the locknuts.

(3) Calculation of Crystal Frequency

f_c = carrier frequency

f_o = crystal frequency

$$f_o = \frac{f_c}{24}$$

Example: f_c = 152.39 mc.

$$f_o = \frac{152.39}{24}$$

f_o = 6,349.6 Kc.

(4) Measurement of B+ Voltage

Transmitter B+ may be read with the aid of a voltmeter connected to the B+ receptacle on the transmitter final amplifier deck chassis. In the "BR" and "BL" stations the B+ is measured using the 0-1000 VDC meter in the cabinet. The RED meter plug lead is normally connected to the 600 V receptacle on the power supply chassis.

4. ALIGNMENT PROCEDURE

IMPORTANT

Read the following steps carefully.

TYPICAL BENCH TEST SET-UP

a. Preliminary Procedure

(1) Attach an antenna dummy load to the (ANT.) connector.

(2) Connect the power plug to the transmitter.

(3) Place the transmitter in operation.

(a) Set the HI-LO power switch in LO position.

(b) Turn "on" the filaments. (Wait 30 seconds before applying high voltage to transmitter (keying).)

(c) Key Transmitter

1. When using fixed station meters:

On "BL" or "BY" models key transmitter by means of standard microphone included with model. On "BR" or "BYR" models key transmitter by means of an auxiliary P-255-A Military Microphone or equivalent connected to microphone receptacle of the power supply.

2. When using a P-8501-A Test Set:

The transmitter may be keyed by pressing the XMTR-ON switch on the test set, or by means of an auxiliary P-255-A Military Type Microphone or equivalent connected to test set microphone receptacle.

CAUTION

Never have the transmitter plate voltage turned on for more than a few seconds

at a time, until the transmitter is completely tuned up. The plate current is excessive in untuned circuits and may result in damage to tubes and parts.

b. Tune T 1A:

(1) Set the selector switch to position 3. (No reading will be observed on position 2 at any time). The meter now reads the grid current of V 3. The circuit is tuned to 2 times the crystal frequency.

(2) Adjust the tuning adjustment screws on T 1A until a maximum is obtained. Adjustment of one of the screws may have some effect on the other; therefore, adjust one and then the other, going back and forth until a definite maximum is obtained.

c. Tune T 2:

(1) Set the selector switch to position -4. This position indicates grid current of V 4. The circuit is tuned to 6 times the crystal frequency.

(2) Peak the meter reading by adjusting the screws on T 2, going back and forth as in the preceding step.

d. Tune L 3 and L 4:

(1) Set the selector switch to position 5. The meter reads grid voltage of V 5. The coils are tuned to 12 times the crystal frequency.

(2) Adjust L 3 and L 4 to obtain a meter peak.

NOTE

An immediate meter reading of about 10 does not indicate alignment of L 3 and L 4; this reading is due to fixed bias which is supplied by the power supply. A definite meter peak will be observed when the circuit is resonant. (HI-LO switch in LO position.)

(3) If the transmitter is badly mis-aligned, or if it is being aligned to a new frequency, some difficulty may be experienced in finding resonance of L 3 and L 4 using the grid voltage of V 5 as the indication of resonance. Under these conditions, set the selector switch to position 4 and tune L 3. A decrease in the meter reading is an indication of resonance. The selector switch of the test set should then be returned to position 5 and L 4 tuned for a maximum reading. L 3 can now be adjusted for maximum.

e. Tune T 3:

Set the selector switch in position 6. Adjust T 3 carefully for a meter peak. Adjustment of T 3 is critical and should be tuned carefully and slowly. The coil is tuned to 24 times the crystal frequency.

NOTE

An immediate meter reading of about 8 does not indicate alignment of T 3. Maximum reading should be at least 15 when the selector switch is in position 6. The initial reading is due to fixed bias which is supplied by the power supply. (HI-LO switch in LO position.)

f. To Tune PA Plate Circuit:

(1) Set the meter to read PA plate current by setting the selector switch to PA position.

(2) Unload the plate circuits as follows:

Back the coupling loop out as far as possible by means of its adjustment screw. (To back out coupling loop, turn screw clockwise.)

(3) Turn the PA PLATE tuning screw for a dip (minimum reading).

(4) The two capacitor plates composing C 24 located at the top end of the PA plate lines have been set and locked at the factory. These plates are used for rough tuning and require only one setting for any frequency channel. The PA plate adjustment screw should be used for normal tuning of the PA plate. However, should capacitor C 24 require adjustment, the following steps should be taken.

(a) Remove the PA cover.

CAUTION

THERE IS NON-INSULATED HIGH VOLTAGE IN THE PA SECTION THAT IS DANGEROUS. The plate lines are operated at 600 volts above ground; therefore, use extreme care when making any adjustments with the PA cover removed. Do not press the push-to-talk button on the microphone or actuate any transmitter test switch while making adjustments on the power amplifier,

other than C 24. When tuning C 24, use the insulated alignment tool provided. DO NOT USE A SCREWDRIVER.

(b) Loosen the locknuts holding the plates. The PA cover has a pronounced effect on the tuning of the plate line. To allow for this effect, adjust the PA PLATE tuning screw so that the bottom of the shorting bar insulator is level with the main chassis.

(c) Tune the plates of C 24 for a minimum reading using the insulated tuning tool provided.

NOTE

At frequencies above 162 mc. the capacitor plates composing C 24 should be set for maximum separation. The power amplifier plate circuit is then tuned only by means of the PA PLATE adjustment screw.

(d) Lock the two plates in position, being careful not to rotate the plates. Replace cover.

(e) The presence of the cover detunes the plate circuit. To return the circuit to resonance, rotate the PA PLATE adjustment screw counterclockwise until the dip in plate current is again observed.

(f) Continue with the normal alignment procedure.

(5) When the meter has been properly dipped as outlined in the preceding steps, place the HI-LO power switch in the HI position and adjust ANT TRIMMER (C 23) for minimum reading. Retune the PA PLATE tuning screw to be sure the meter is still at a minimum.

g. Output Coupling

(1) With the meter still set to read PA PLATE current, adjust the ANT TRIMMER for maximum reading on the meter.

(2) If an RF Wattmeter is available:

The MOTOROLA P-7208 Dummy Load may be used with the P-8501-A Test Set to measure RF power output. Refer to the P-8501-A Instructions for operation.

(a) Adjust the COUPLING loop until the transmitter is loaded to the desired RF power output as indicated on the RF Wattmeter.

NOTE

F.C.C. regulations state: The power which may be used by a station shall be no more than the minimum required for satisfactory technical operation commensurate with the size of the area to be served and local conditions which affect radio transmission and reception.

Example: Federal Register, Volume 14, Number 87, Page 2323, Paragraph 10.106.

(b) Readjust the ANT TRIMMER capacitor C 23 for a maximum reading on the RF Wattmeter.

(c) DO NOT exceed 200 milliamperes plate current (40 microamperes reading on portable test set).

(3) If a dummy load lamp is available:

(a) Adjust the antenna coupling loop L 11 until a maximum brightness has been obtained.

(b) Readjust the ANT TRIMMER capacitor C 23 for a maximum reading on the alignment meter.

(c) DO NOT exceed 200 milliamperes plate current (40 microamperes reading on portable test set).

(4) To load the antenna:

(a) Connect the antenna to be used for normal operation to the antenna connector on the transmitter chassis.

(b) Move the antenna loop L 11 in slightly be turning the coupling screw one-half turn. Tune the PA PLATE through resonance--note the "dip" at resonance.

(c) Repeat the above operation and note each time that as the coupling increases the "dip" at resonance will become less pronounced. The point at which the dip is barely noticeable indicates the point of maximum output. Do not turn the coupling loop beyond this point as the transmitter will become overcoupled.

(d) DO NOT exceed 200 milliamperes plate current (40 microamperes reading on portable test set).

NOTE

Care should be taken not to overcouple the transmitter to the antenna as the plate current "dip" will disappear and actual power output will be below the maximum value. Also, a false dip may occur which will not be coincident with maximum power output.

When using this method of coupling, it is recommended that a field strength meter (P-8501-A Portable Test Set) be used to check the transmitter for maximum radiation.

h. Summary

(1) With the transmitter turned "on", repeak T 1A, T 2, T 3, L 3 and L 4.

NOTE

If a field strength meter is available (P-8501-A Test Set), the ANT TRIMMER and COUPLING adjustments may be adjusted for maximum reading on the field strength meter. The PA plate current reading of 40 (200 ma.) should not be exceeded.

(2) In aligning a two-frequency transmitter, the set is normally aligned to the higher frequency. When aligning a three-frequency transmitter, tune to the middle frequency.

(3) Transmitter minimum readings after adjustments.

(a) The values listed below for positions 3, 4, 5 and 6 of the selector switch are minimum readings required to obtain a nominal output from the transmitter. These values are relative and will vary with each unit. However, the readings provide a good indication of power output when compared with normal values previously recorded or supplied by the factory.

NOTE

When aligning a transmitter operating on a frequency above 162 mc. the minimum meter reading in position 3, 4, 5 & 6 will be slightly lower than the readings listed above. The higher the transmitter frequency (above 162 mc.), the greater, the difference. Transmitters operating on 174 mc. will have readings 10 to 15% lower than those listed below.

(b) When in switch position 7, the P-8501-A Test Set becomes a transmitter B+ voltmeter with a full scale deflection of 1000 VDC.

(c) When using a P-8501-A Test Set

SWITCH POSITION	1	2	3	4	5	6	7	8	PA
METER READING	No. Ind.	No. Ind.	20	20	20	17	31	*	40 max.

*NOTE 1: Position 8 reads DC relay control voltage when transmitter is not being keyed and zero (0) when transmitter is being keyed. To obtain actual voltage readings, multiply the meter readings of the P-8501-A Test Set by 0.3.

**NOTE 2: True value of PA current as read on the test set is 5000 times scale reading. Example: Scale reading equal to 40 ua. is a true reading of 200 ma.

NOTE 3: The circuits being metered by the P-8501-A Test Set for various selector switch positions are as follows:

SWITCH POSITION	TRANSMITTER CIRCUIT
1	Not Used
2	No Connection
3	Grid Current, Tripler V 3
-4	Grid Current, 2nd Doubler V 4
+4 PA	Power Amplifier Plate Current
5	Grid Voltage, Doubler Driver V 5
6	Grid Voltage, Power Amplifier V 8
7	PA Plate Voltage
8	Transmitter Relay Control Voltage

NOTE 4: Refer to the factory final test PA reading enclosed with the transmitter. Use this reading as a criterion when re-aligning the transmitter.

NOTE 5: For maximum tube life, it is recommended that the output be coupled just sufficiently to provide dependable communications within your desired range.

(d) When using base station in place meters.

SWITCH POSITION	1	2	3	4	5	6	PA
METER READING	Not Used	No Ind.	20	20	20	17	200 ma. max.

NOTE 1: Base station in-place meter readings are in microamperes except in PA position which is in milliamperes.

Base station front panel test meter has a scale for direct reading in milliamperes. This scale is applicable only when in "PA" metering position.

NOTE 2: Refer to the factory final test PA reading enclosed with the transmitter. Use this reading as a criterion when re-aligning the transmitter.

NOTE 3: For maximum tube life, it is recommended that the output be coupled just sufficiently to provide dependable communications within your desired range.

5. AUDIO ADJUSTMENTS

a. Microphone Level Adjustment ("Suffix P" Versions Only)

The microphone input level control on the pre-amplifier is adjusted at the factory for normal speech and will require no further adjustment.

The procedure for checking and adjusting the input level is as follows (Read carefully before making adjustments):

(1) Connect a DC vacuum tube voltmeter or other suitable DC voltmeter between pin 2 of V 4 (6AL5 Clipper tube) and chassis ground.

(2) Set the meter on the lowest (0-2.5 V) DC scale. The meter should read approximately one volt when the "push-to-talk" button is pressed. (The exact meter reading is not important.)

(3) Operate the "push-to-talk" button on the microphone and speak in a normal transmitting voice. If the level control is properly adjusted the meter deflection will remain constant during normal speech. There will be a small variation in meter deflection with slightly louder-than-normal speech.

(4) If a variation in meter deflection is observed when talking into the microphone with a normal transmitting voice, turn the input level control counterclockwise until no change in deflection occurs. The input level control is located adjacent to the microphone receptacle.

(5) As a check, talk into the microphone in a slightly louder-than-normal voice. A small variation in meter deflection should now occur. If no variation in meter deflection is noted, turn the input level control clockwise until a small variation occurs with a slightly louder-than-normal voice.

b. I.D.C. Instantaneous Deviation Control

The adjustable I.D.C. circuit has been set for proper operation and sealed at the factory.

No attempt should be made to change this adjustment unless a MOTOROLA F4MU-24B Series Station Monitor or equivalent is available to check modulation deviation.

In the event that readjustment of the I.D.C. circuit becomes necessary:

(1) Set up a MOTOROLA F4MU-24B Series Station Monitor for FREQUENCY DEVIATION MEASUREMENT. Refer to the Station Monitor Instruction Manual for measurement instructions.

(2) Turn the monitored transmitter "on" and modulate with a loud sustained oral tone (use the word Ah-h-h----).

(3) Adjust the I.D.C. control on the transmitter chassis until the MODULATION DEVIATION meter on the station monitor reads 13 kc.---note that the MODULATION DEVIATION meter will swing up to 15 kc. on voice peaks.

NOTE

F.C.C. rules and regulations stipulate a maximum allowable modulation deviation in the 152-174 mc. band of ±15 kc.

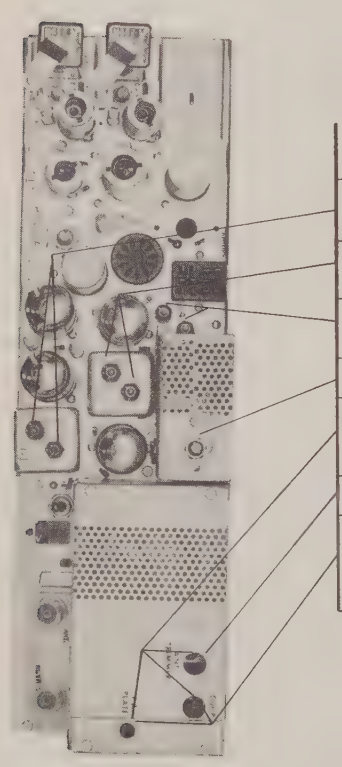
c. Audio Sensitivity Adjustment

All transmitters described herein except the CP and BP version have two level connections to

the first I. D. C. amplifier for modifying the basic audio sensitivity of the unit. This is achieved by connecting the grid lead (pin 2 of V 6, 12AX7) to either of two points as shown on the schematic diagram. When a MOTOROLA military type carbon microphone or equivalent is to be used with the transmitter, connect the grid lead to position #1 (0.25 volt sensitivity). For remote control applications (500 ohm line), or when a handset is employed, use position #2 (0.18 volt sensitivity).

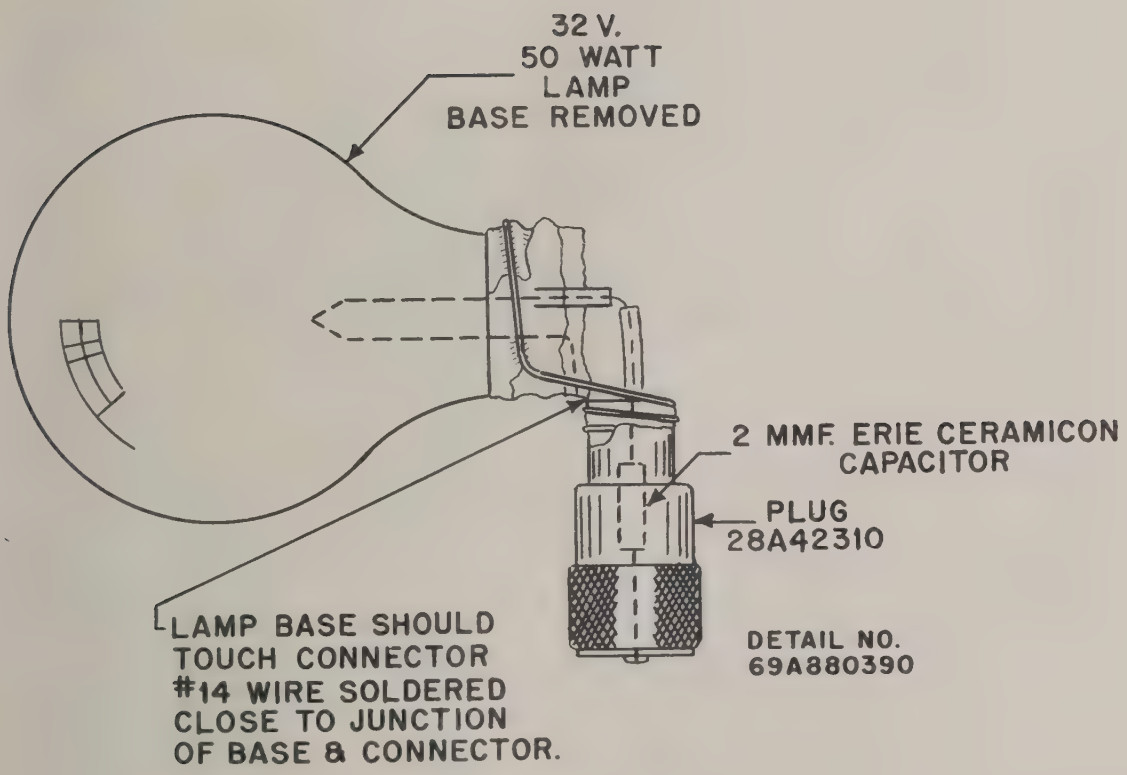
6. SIMPLIFIED ALIGNMENT PROCEDURE

After the serviceman becomes familiar with the alignment of this unit he may use the Simplified Alignment Procedure as a check list. He should not attempt to use the check list until he has followed the complete alignment procedure using the P-8501-A Portable Test Set detailed earlier in this section.



SEQUENCE	METER POSITION	ADJUSTMENT	METER READING	STAGE AND PROCEDURE
Step 1	3	T1A (primary & secondary)	Maximum	1st doubler plate, tripler grid. Turn screws alternately.
Step 2	-4	T2 (primary & secondary)	Maximum	Tripler plate, 2nd doubler grid. Turn screws alternately.
Step 3	5	L 3 & L 4	Maximum	2nd doubler plate, doubler-driver grid. Turn screws alternately.
Step 4	6	T 3	Maximum	Doubler-driver plate. Tune slowly.
Step 5	PA(+4)	COUP, PA PLATE, & ANT TRIMMER	Minimum	PA Plate & output coupling. Decouple antenna then adjust PA PLATE & ANT TRIMMER.
Step 6	PA(+4)	ANT TRIMMER	Maximum	Antenna tuning. Tune slowly.
Step 7	PA(+4)	COUP & PA PLATE	As desired but less than 200 ma.	Antenna loading. Connect antenna. Make repeated small adjustments of COUP screw and dip reading with PA PLATE screw.

152-174 MC. 30 OR 60 WATT TRANSMITTER
DUMMY ANTENNA LAYOUT

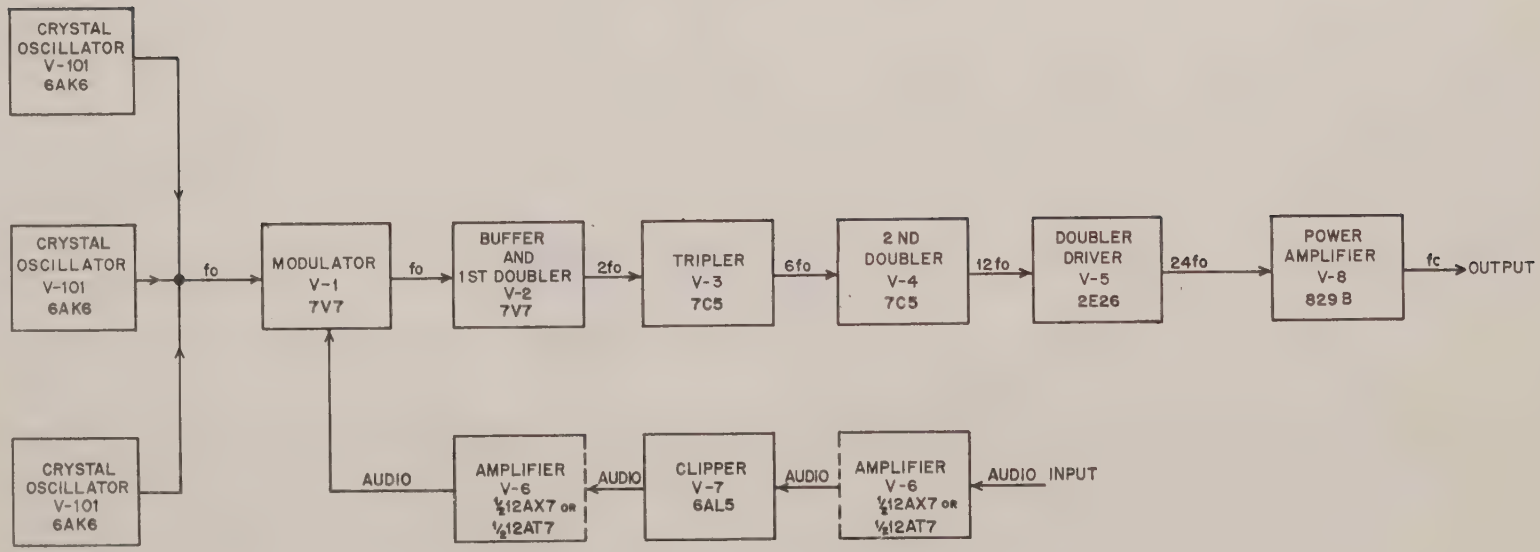


MOTOROLA
PART NO. 69A880390
ISSUE - A 10/54-CP

MOTOROLA
PART NO. 63C802349
ISSUE - C 10/54-CP

152-174 MC. 60 WATT TRANSMITTER CHASSIS BLOCK DIAGRAM

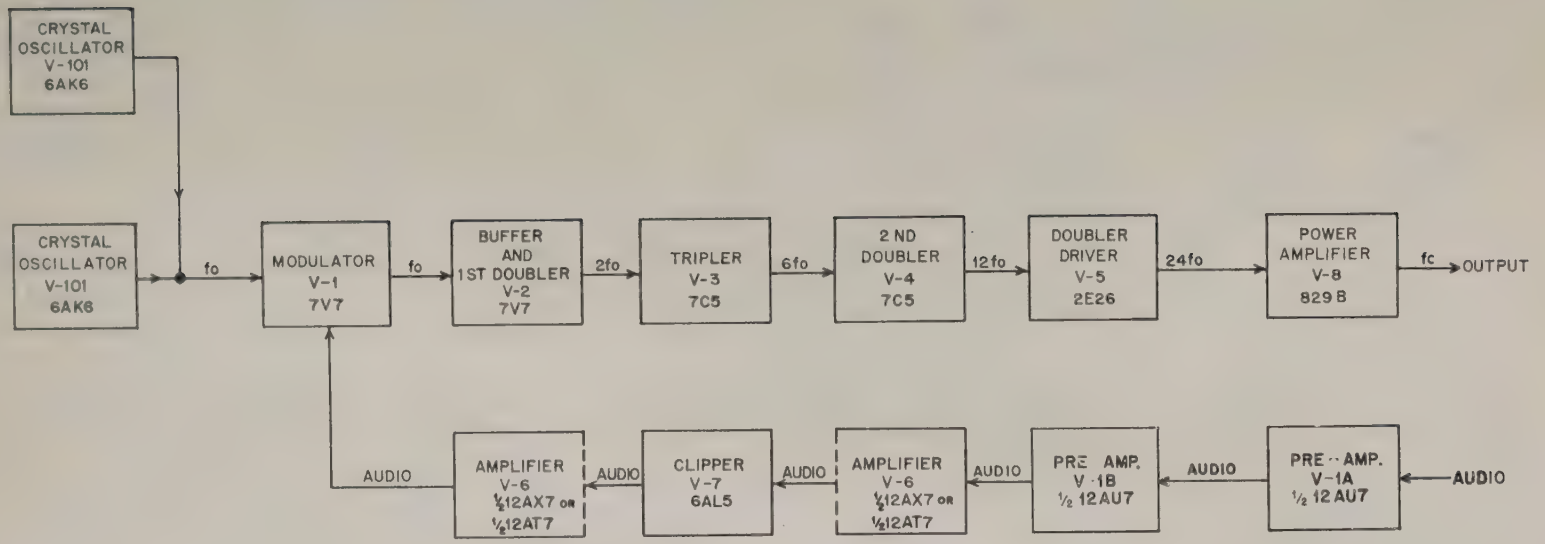
THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8491-B, PA-8492-B AND PA-8493-B



LEGEND

fo = OSCILLATOR FREQUENCY
fc = CARRIER FREQUENCY
$fo = \frac{fc}{24}$
fc = 24 fo = 152 TO 174 MEGACYCLES
fo = 6333 TO 7250 KILOCYCLES

THIS DIAGRAM IS APPLICABLE TO THE
FOLLOWING CHASSIS: PA-8491-BP
AND PA-8492-BP



LEGEND

fo = OSCILLATOR FREQUENCY
fc = CARRIER FREQUENCY
$fo = \frac{fc}{24}$
fc = 24 fo
fo = 6333 TO 7250 KILOCYCLES
fo = 152 TO 174 MEGACYCLES

DIAGRAM NO. 63C804357

MOTOROLA
PART NO. 63C804357
ISSUE - A 10/54-CP

152-174 MC. 60 WATT TRANSMITTER CHASSIS
WITH PRE-AMPLIFIER
BLOCK DIAGRAM

152-174 MC. 60 WATT TRANSMITTER CHASSIS PARTS LOCATION DETAIL

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8491-B, PA-8492-B AND PA-8493-B

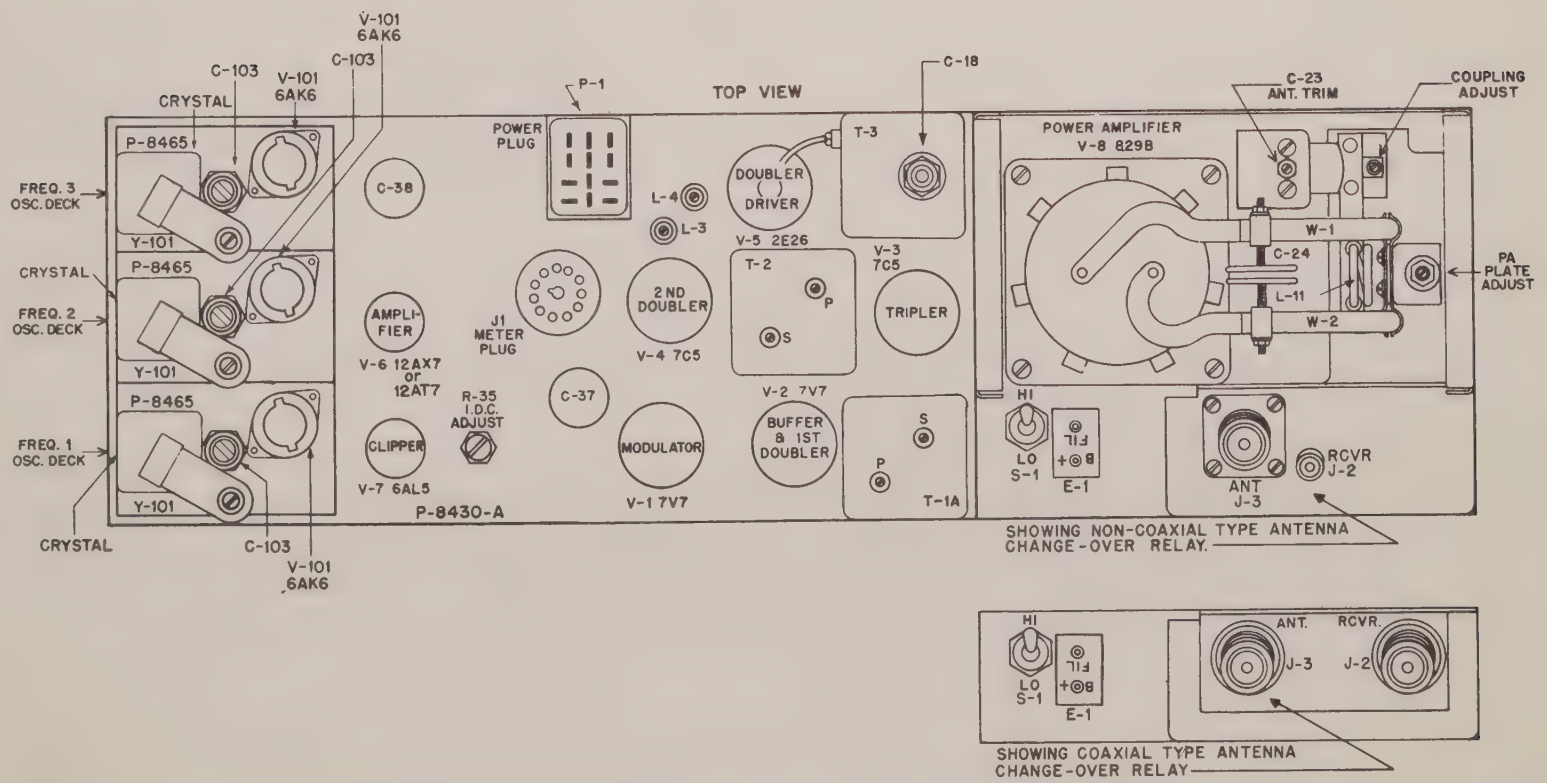
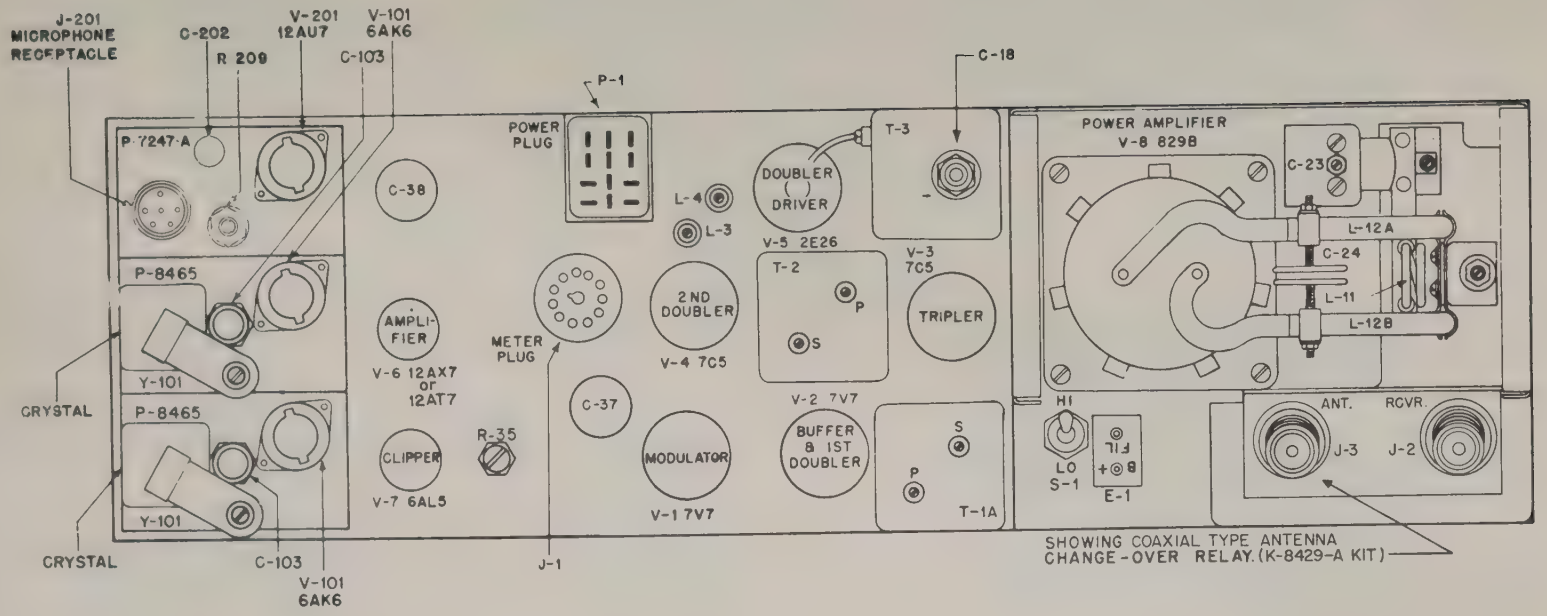


DIAGRAM NO. 69C802350

THIS DIAGRAM IS APPLICABLE TO THE
FOLLOWING CHASSIS: PA-8491-BP
AND PA-8492-BP



MOTOROLA
PART NO. 69C804358
ISSUE - B 10/54-CP

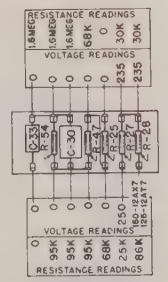
152-174 MC. 60 WATT TRANSMITTER CHASSIS
WITH PRE-AMPLIFIER
PARTS LOCATION DETAIL

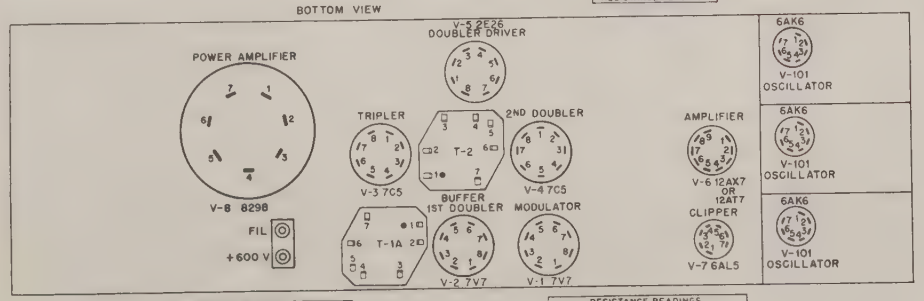
MOTOROLA
PART NO. 63D802351
ISSUE - G 10/54-CP

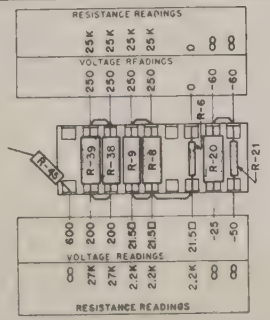
152-174 MC. 60 WATT TRANSMITTER CHASSIS VOLTAGE AND RESISTANCE DIAGRAM

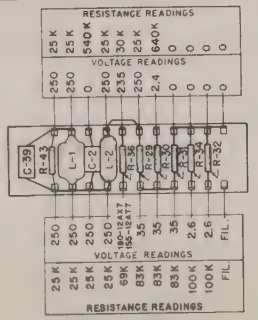
THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8491-B, PA-8492-B AND PA-8493-B

NOTES
1. ALL READINGS TAKEN AGAINST GROUND. VOLTAGE MEASUREMENTS TO BE MADE WITH A VACUUM TUBE VOLTMETER.
2. POWER PLUG AND METER PLUG DISCONNECTED FROM UNIT WHEN MEASURING RESISTANCE.
3. ALL VOLTAGES INDICATED OBTAINED WITH NOMINAL SUPPLY VOLTAGES (LO-B-250 V HI-B-600V) AND NOMINAL POWER OUTPUT.
4. X READINGS TAKEN WITH 1 MEG RESISTOR IN SERIES WITH METER LEAD
5. ⊕ TIE POINT
6. FILAMENT VOLTAGE 6.3 VAC OR DC
7. THIS READING VARIES WITH ADJUSTMENT OF R-35.
8. Δ THIS VALUE IS 100 OHMS WHEN OSCILLATOR DECK IS WIRED OR SWITCHED IN. OTHERWISE READING IS ∞. (SEE SCHEMATIC AND INTERCABLING DIAGRAM.)
9. □ MICROPHONE NOT IN CIRCUIT
10. HI-LO SWITCH IN HI POSITION.
11. EITHER A 12AT7 OR A 12AX7 MAY BE USED.
12. THREE FREQUENCY TRANSMITTER AVAILABLE ON SPECIAL ORDER ONLY.
13. ALL READINGS MAY VARY 20% EXCEPT B+ WHICH MAY VARY 10%.
14. ALL TUBES MUST BE IN PROPER SOCKETS.









VOLTAGE

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS									
		1	2	3	4	5	6	7	8	9	CAP
6AK6 ⊕ OSC.	V-101	-9	0	FIL.	FIL.	250	135	12	–	–	–
6AK6 + OSC.	V-101	0	0	FIL.	FIL.	250	250	30	–	–	–
6AK6 ⊕ OSC	V-101	0	0	FIL	FIL.	250	250	30	–	–	–
7V7 MOD.	V-1	FIL.	250	250	250	0	0	10	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL.	225X	100	0	0	-4.0	0	FIL	–	–
7C5 TRIPLER	V-3	FIL.	220X	160	NC	250✱	-50✱	0	FIL.	–	–
7C5 2ND DOUBLER	V-4	FIL.	230X	180	250✱	250✱	-60X	0	FIL.	–	–
2E26 DBLR. DRVR.	V-5	0	FIL.	140	0	-60X	0	FIL.	0	–	400X
12AX7 AMPLIFIER	V-6	150	0	0.9	FIL.	FIL.	180	0	1.3	FIL.	–
6AL5 CLIPPER	V-7	2.6	2.4	FIL	FIL.	2.6	0	2.4	–	–	–
8298 PWR. AMP	V-8	FIL.	-50X	200	0	FIL.	-50X	FIL.	–	–	560X
SEE NOTE 11 12AT7 AMPLIFIER	V-6	125	0	14	FIL.	FIL.	155	0	2.6	FIL.	–

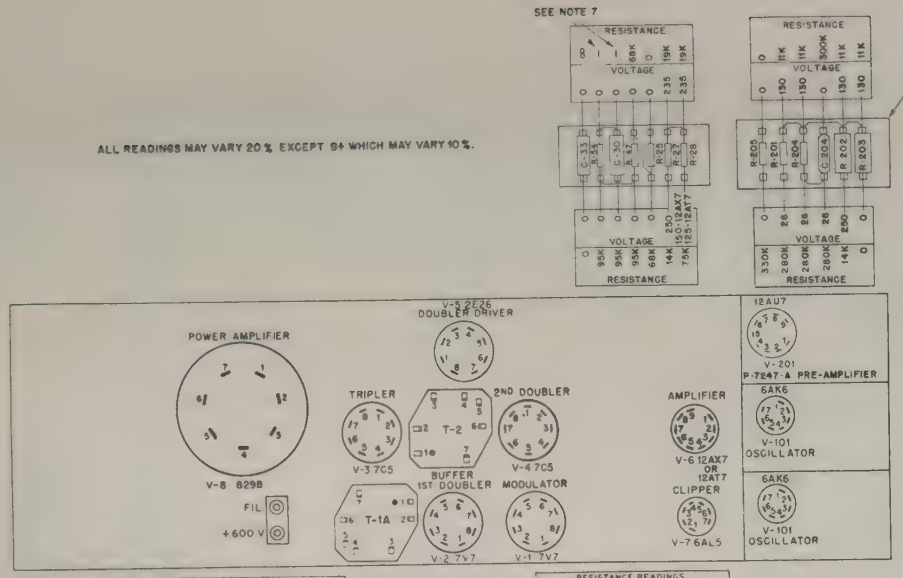
+ VALUES SHOWN FOR OSCILLATOR NOT IN USE.
⊕ VALUES SHOWN FOR OSCILLATOR IN USE.

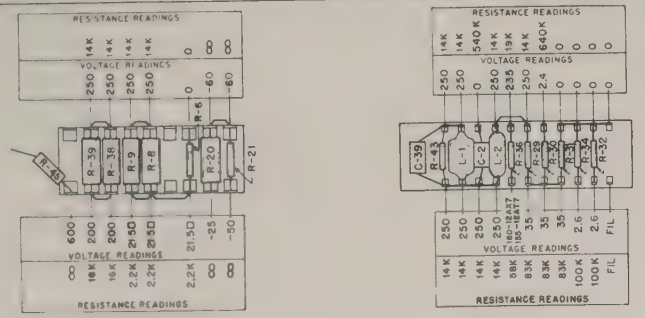
TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS						
	1	2	3	4	5	6	7
T-1A	0	250	225X	-.7	0	-60	-60 x
T-2	0	250	220X	-.9	0	-75	-60 x

RESISTANCE

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS									
		1	2	3	4	5	6	7	8	9	CAP
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	25 K	93 K	100Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	25 K	93 K	100Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	25 K	93 K	100Δ	–	–	–
7V7 MOD.	V-1	FIL.	25 K	25 K	25 K	0	540 K	1500	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL.	26 K	125 K	0	0	470 K	0	FIL.	–	–
7C5 TRIPLER	V-3	FIL.	26 K	81K	NC.	25 K✱	270 K	0	FIL.	–	–
7C5 2ND DOUBLER	V-4	FIL.	25K	58K	25K✱	25 K✱	180 K	0	FIL.	–	–
2E26 DBLR. DRVR.	V-5	0	FIL.	∞	0	∞	0	FIL.	0	–	8
12AX7 AMPLIFIER	V-6	86 K	68K OR 82K	560	FIL	FIL.	69 K	NOTE 7	1000	FIL.	–
6AL5 CLIPPER	V-7	100 K	640K	FIL	FIL.	100 K	0	640 K	–	–	–
8298 PWR. AMP.	V-8	FIL.	∞	27K	0	FIL.	∞	FIL.	0	–	8
SEE NOTE 11 12AT7 AMPLIFIER	V-6	86 K	68K OR 82K	560	FIL.	FIL.	69K	NOTE 7	1000	FIL.	–

TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS						
	1	2	3	4	5	6	7
T-1A	0	25K	26K	2700	0	270 K	270 K
T-2	0	25K	26K	1500	0	180K	180K





VOLTAGE

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9	CAP
6AK6 ⊕ OSC.	V-101	-9	0	FIL.	FIL.	250	135	12	–	–	–
6AK6 + OSC.	V-101	0	0	FIL.	FIL.	250	250	30	–	–	–
12AU7 PRE-AMP.	V-201	26	0	1.3	FIL.	FIL.	26	0	1.3	FIL.	–
7V7 MOD.	V-1	FIL.	250	250	250	0	0	10	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL.	225 X	100	0	0	-40	0	FIL.	–	–
7C5 TRIPLER	V-3	FIL.	220 X	160	NC	250#	-50 X	0	FIL.	–	–
7C5 2ND DOUBLER	V-4	FIL.	230 X	190	250*	250#	-60 X	0	FIL.	–	–
2E26 DBLR. DRVR.	V-5	0	FIL.	140	0	-60 X	0	FIL.	0	–	400X
12AX7 AMPLIFIER	V-6	150	0	0.9	FIL.	FIL.	180	0	1.3	FIL.	–
6AL5 CLIPPER	V-7	2.6	2.4	FIL.	FIL.	2.6	0	2.4	–	–	–
SEE NOTE 8 829B PWR AMP	V-8	FIL.	-50X	200	0	FIL.	-50X	FIL.	–	–	560X
12AT7 AMPLIFIER	V-6	125	0	1.4	FIL.	FIL.	155	0	2.6	FIL.	–

+ VALUES SHOWN FOR OSCILLATOR NOT IN USE.
⊕ VALUES SHOWN FOR OSCILLATOR IN USE

TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS						
	1	2	3	4	5	6	7
T-1A	0	250	225X	-.7	0	-60	-50 X
T-2	0	250	220X	-.9	0	-75	-60 X

VOLTAGE NOTES:

1. ALL READINGS TAKEN AGAINST GROUND. VOLTAGE MEASUREMENTS TO BE MADE WITH A VACUUM TUBE VOLTMETER.
2. ALL VOLTAGES INDICATED OBTAINED WITH NOMINAL SUPPLY VOLTAGES (LO-B-250 V HI-B-600V) AND NOMINAL POWER OUTPUT.
3. X READINGS TAKEN WITH 1 MEG RESISTOR IN SERIES WITH METER LEAD.
4. □ = MICROPHONE NOT IN CIRCUIT.
5. FIL. AMENT VOLTAGE 6V AC OR DC.
6. HI-LO SWITCH IN HI POSITION.
7. * TIE POINT.
8. EITHER A 12AT7 OR A 12AX7 TUBE MAY BE USED.

RESISTANCE

TUBE LEGEND	TUBE N°	TUBE SOCKET PIN NUMBERS								
		1	2	3	4	5	6	7	8	9	CAP
6AK6 OSC.	V-101	47 K	0	FIL.	FIL.	14K	82K	100 Δ	–	–	–
6AK6 OSC.	V-101	47 K	0	FIL	FIL	14K	82K	100 Δ	–	–	–
12AU7 PRE-AMP	V-201	280K	47K	3.9K	FIL.	FIL.	280K	330K	3.9K	FIL	–
7V7 MOD.	V-1	FIL	14K	14K	14K	0	540 K	1500	FIL.	–	–
7V7 1ST DOUBLER	V-2	FIL	15K	114K	0	0	470 K	0	FIL.	–	–
7C5 TRIPLER	V-3	FIL	15K	70K	N.C.	14K *	270 K	0	FIL	–	–
7C5 2ND DOUBLER	V-4	FIL.	14K	47K	14K *	14K *	180 K	0	FIL.	–	–
2E26 DBLR DRVR	V-5	0	FIL.	∞	0	∞	0	FIL.	0	–	∞
12AX7 AMPLIFIER	V-6	75K	68K	560	FIL	FIL	58K	NOTE 4	1000	FIL.	–
6AL5 CLIPPER	V-7	100 K	640K	FIL	FIL	100 K	0	640 K	–	–	–
8298 PWR AMP	V-8	FIL	∞	16K	0	FIL.	∞	FIL.	0	–	∞
SEE NOTE 6 12AT7 AMPLIFIER	V-6	75K	68K	560	FIL.	FIL.	58K	NOTE 4	1000	FIL.	–

TRANSFORMER N°	TRANSFORMER BASE PIN NUMBERS						
	1	2	3	4	5	6	7
T-1A	0	14K	15K	3300	0	270 K	270 K
T-2	0	14 K	15K	1800	0	180K	180K

RESISTANCE NOTES:

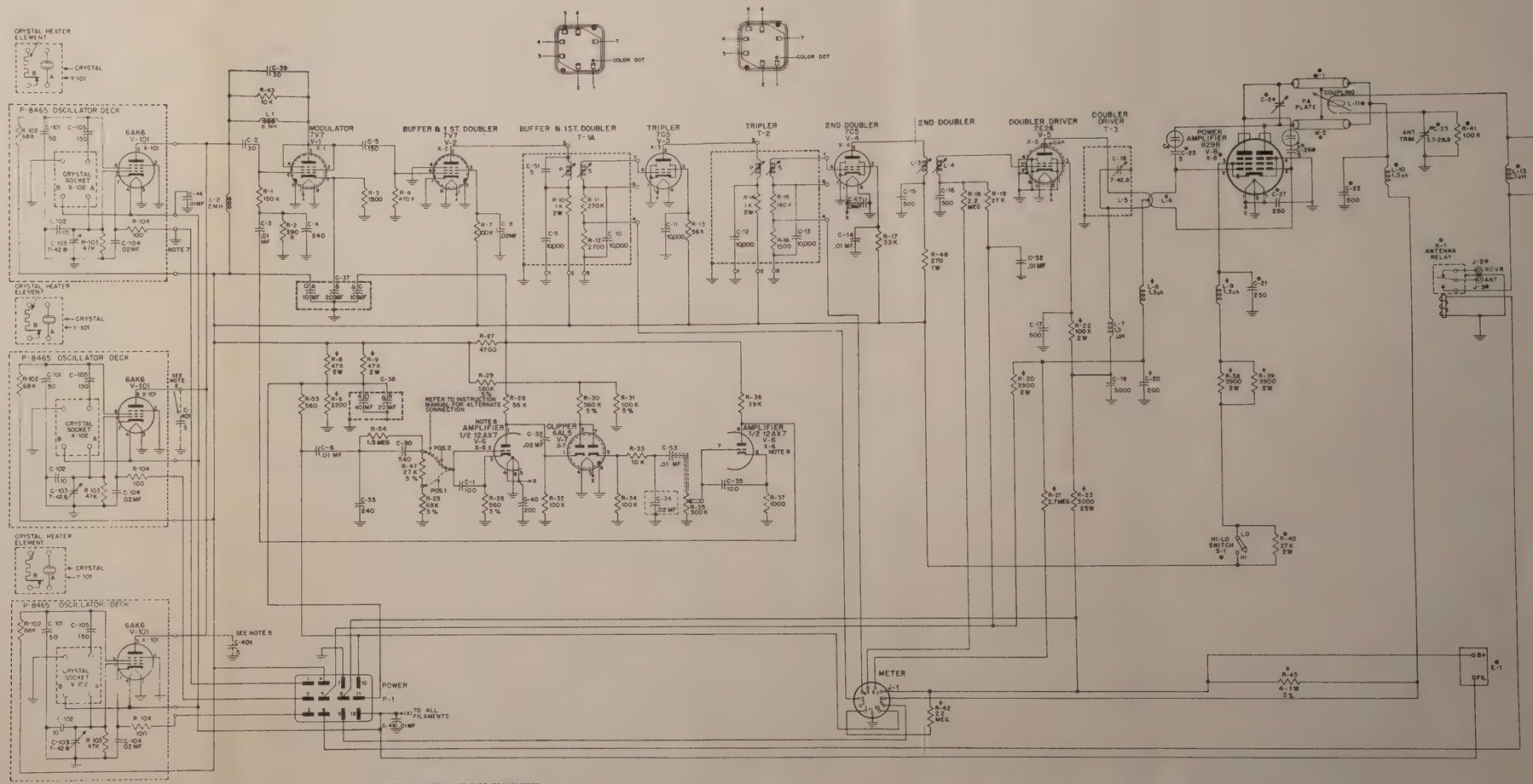
1. ALL READINGS TAKEN AGAINST GROUND.
2. POWER PLUG AND METER PLUG DISCONNECTED FROM UNIT. ALL TUBES IN SOCKETS.
3. * TIE POINT.
4. THIS READING VARIES WITH ADJUSTMENT OF R-35.
5. Δ THIS VALUE IS 100 OHMS WHEN OSCILLATOR DECK IS WIRED OR SWITCHED IN. OTHERWISE READING IS ∞. (SEE SCHEMATIC AND INTERCABLING DIAGRAM.
6. EITHER 12AT7 OR 12AX7 TUBE MAY BE USED.
7. THIS READING VARIES WITH ADJUSTMENT OF R-209.

THIS DIAGRAM IS APPLICABLE TO THE FOLLOWING CHASSIS: PA-8491-BP AND PA-8492-BP

MOTOROLA
PART NO. 63D804359
ISSUE - D 10/54-CP

152-174 MC. 60 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER VOLTAGE AND RESISTANCE DIAGRAM

152-174 MC. 60 WATT TRANSMITTER CHASSIS SCHEMATIC DIAGRAM



MODEL DESCRIPTION - 60 WATT TRANSMITTER

MODEL	CHANNELS	PRIMARY VOLTAGE
PA-8491-B	1 FREQUENCY	6 V.D.C. OR 117 V.A.C.
PA-8492-B	2 FREQUENCY	6 V.D.C. OR 117 V.A.C.
*PA-8493-B	3 FREQUENCY	6 V.D.C. OR 117 V.A.C.

*NOTE: THREE FREQUENCY TRANSMITTERS ARE NOT APPLICABLE TO REMOTELY CONTROLLED INSTALLATIONS AND ARE AVAILABLE ON SPECIAL ORDER ONLY.

NOTES
1. RESISTOR VALUES INDICATED IN OHMS UNLESS OTHERWISE STATED. K=1,000 OHMS.
2. CAPACITOR VALUES INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED.
3. INDUCTANCE VALUES: MH=MILLIHENRYS, µH=MICROHENRYS
4. CONNECTORS SHOWN AS VIEWED FROM WIRING SIDE.
5. CAPACITOR C 401 IS K-8582-A DUMMY OSC. DECK.
6. (CA) THIS SYMBOL INDICATES NEUTRALIZING CAPACITY INHERENT BY MECHANICAL ASSEMBLY.
7. GROUND CONNECTION USED ONLY FOR ONE FREQ. XMTR (PA-8491-B). GROUND MUST BE REMOVED WHEN TWO OR MORE FREQ. ARE USED.
8. 12AX7 MAY BE REPLACED BY 12AT7.

● INDICATES COMPONENTS WHICH ARE PART OF P-8467 RF OUTPUT DECK.
♦ INDICATES COMPONENTS WHICH ARE PART OF K-8469 CHASSIS KIT.
ALL OTHER COMPONENTS ARE PART OF P-8430-A BASIC CHASSIS.

THIS SCHEMATIC DIAGRAM IS APPLICABLE AS DRAWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN THE TABLE BELOW. IT IS APPLICABLE TO EACH EARLIER PRODUCTION CHASSIS WHEN AMENDED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS.

CHASSIS	DISCONTINUED VERSIONS	LATEST VERSION
PA-8491-B	-1 -2 -3 -4 -5 -6 -7 -8 -9 -10	-11
PA-8492-B	-1 -2 -3 -4 -5 -6 -7 -8 -9 -10	-11
PA-8493-B	-1 -2 -3 -4 -5 -6 -7 -8 -9 -10	-11

MODIFYING SERVICE BULLETIN NUMBERS: 547

MOTOROLA
PART NO. 63E802352
ISSUE - L 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., basic chassis, RF decks, etc. When ordering replacement parts specify part number, description, schematic diagram number, diagram issue, and reference symbol of the part.

PA-8491-B, PA-8492-B and PA-8493-B

Reference:
Schematic Diagram
63E802352

1. P-8430-A Strip Transmitter Chassis (Basic)

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 1	21R6631	Fixed: silver mica; 100 mmf ±10%; 500 vdcw
C 2	21R2733	Fixed: silver mica; 30 mmf ±10%; 500 vdcw
C 3	21A801139	Fixed: ceramic; disc; .01 mf +80-20%; 600 vdcw
C 4	21R6662	Fixed: mica; 240 mmf ±10%; 500 vdcw
C 5	21R2701	Fixed: silver mica; 150 mmf ±10% 500 vdcw
	or 21R6527	Fixed: silver mica; 150 mmf ±10% 500 vdcw
C 6		Same as C 3
C 7		NOT USED
C 8	21R401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 11		Same as C 3
C 14		Same as C 3
C 15	21A881306	Fixed: ceramic; 500 mmf ±10%; 500 vdcw
C 16		Same as C 15
C 17		Same as C 15
C 19	21K893343	Fixed; mica; 5000 mmf ±20%; 1000 vdcw
C 30	21K803505	Fixed: silver mica; 540 mmf ±3%; 500 vdcw
C 32		Same as C 8
C 33		Same as C 4
C 34	8K836754	Fixed: oil filled; tubular; .02 mf ±10%; 400 vdcw
C 35		Same as C 1
C 37	23K892117	Fixed: electrolytic; 3 section; consisting of:
C 37A		□ 10 mf +50-10%; 450 vdcw; section
C 37B		20 mf +100-10%; 25 vdcw; section
C 37C		△ 10 mf +50-10%; 450 vdcw; section
C 38	23K832217	Fixed: electrolytic; 2 section; consisting of:
C 38A		□ 40 mf +100-10%; 150 vdcw
C 38B		△ 20 mf +100-10%; 150 vdcw
C 39		Same as C 2
C 40	21R2748	Fixed; mica; 200 mmf ±10%; 500 vdcw
C 46		Same as C 3
C 47		Same as C 3
C 48		Same as C 3
C 52		Same as C 3
C 53		Same as C 3
		CONNECTOR,
J 1	9B86864	Receptacle: female; 11 contact; polarized; round; black plastic base; does not include 42A821428 RING, connector retainer; which must be ordered separately; METER
L 1	24K483466	COILS, RF: choke; 6 millihenries
L 2	24A483465	RF: choke; 2 millihenries
L 7	24A891063	RF: choke; 1.3 microhenries
		CONNECTOR,
P 1	28A483376	Receptacle: male; 12 contact; polarized; rectangular; black phenolic base; saddle mounting; POWER
		RESISTORS,
R 1	6R6398	Fixed: carbon; 150,000 ohm ±10%; 1/2 w; ins.
R 2	6R5646	Fixed: carbon; 390,000 ohm ±10%; 1/2 w; ins.
R 3	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.
R 4	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 5		NOT USED
R 7	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 13	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.
R 17	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.
R 18	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 19	6R6434	Fixed: carbon; 27,000 ohm ±10%; 1/2 w; ins.
R 25	6R6479	Fixed: carbon; 68,000 ohm ±5%; 1/2 w; ins.
R 26	6R400058	Fixed: carbon; 560 ohm ±5%; 1/2 w; ins.
R 27	6R6080	Fixed: carbon; 4700 ohm ±10%; 1/2 w; ins.
R 28		Same as R 13
R 29	6R5796	Fixed: carbon; 560,000 ohm ±5%; 1/2 w; ins.
R 30		Same as R 29
R 31	6R5553	Fixed: carbon; 100,000 ohm ±5%; 1/2 w; ins.
R 32		Same as R 7
R 33	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 34		Same as R 7
R 35	18K892291	Variable: carbon; 300,000 ohm ±20%
R 36	6R6487	Fixed: carbon; 39,000 ohm ±10%; 1/2 w; ins.
R 37	6R6229	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins.
R 43		Same as R 33
R 47	6R5786	Fixed: carbon; 27,000 ohm ±5%; 1/2 w; ins.
R 48	6R6336	Fixed: carbon; 270 ohm ±10%; 1 w; ins.
R 53	6R6291	Fixed: carbon; 560 ohm ±10%; 1/2 w; ins.
R 54	6R6460	Fixed: carbon; 1.5 megohm ±10%; 1/2 w; ins.
		TUBES,
V 1	7V7	Electron
V 2		Same as V 1
V 3	7C5	Electron
V 4		Same as V 3
V 5	2E26	Electron
V 6	12AX7 or 12AT7	Electron
V 7	6AL5	Electron
		SOCKETS,
X 1	9A83952	Tube: female; 8 contact, mica filled phenolic base; saddle mounting
X 2		Same as X 1
X 3		Same as X 1
X 4		Same as X 1
X 5	9A890001	Tube: female; 8 contact; brown and tan bakelite wafer base; saddle mounting
X 6	9K832481	Tube: female; 9 contact; miniature; black phenolic base; saddle mounting; includes center shield and tube shield base
X 7	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base

2. K-8432 Coil Kit (p/o P-8430-A)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 9	21A801139	Fixed: ceramic; .01 mf +80-20%; 600 vdcw; disc; p/o T 1A
C 10		Same as C 9; p/o T 1A
C 12		Same as C 9 except p/o T 2
C 13		Same as C 9 except p/o T 2
C 18	19A475604	Variable: air; 7 mmf to 42.8 mmf p/o T 3
C 51	21A813136	Fixed: ceramic; 5 mmf 1.5 mmf 500 vdcw; p/o T 1A
		COILS,
L 3	1V85835	RF: 2nd Doubler Plate
L 4	1V892523	RF: Doubler Driver Grid
L 5	24B483514	RF: Doubler Driver Plate; p/o T 3
		RESISTORS,
R 10	6R3922	Fixed: carbon; 1000 ohm ±10%; 2 w; ins.; p/o T 1A
R 11	6R6414	Fixed: carbon; 270,000 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 12	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 14		Same as R 10 except p/o T 2
R 15	6R6444	Fixed: carbon; 180,000 ohm ±10%; 1/2 w; ins.; p/o T 2
R 16	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.; p/o T 2
		COILS,
T 1A	24B813173	RF: Buffer and 1st Doubler
T 2	24B881294	RF: Tripler
T 3	1V880036	RF: Doubler Driver

3. P-8467 RF Output Deck (60 Watt)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 21	1A84707	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 22	21K891905	Fixed: mica; 500 mmf ±20%; 200 vdcw
C 23	19A84648	Variable: air; 3.7 mmf to 28.9 mmf; ANTENNA
C 24		Variable: air; consisting of: 51A483511 PLATE, capacitor; and screw (2 required for capacitance)
C 25	21K86229	Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw
C 26		Same as C 25
C 27	1K84708	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 49	21R2788	Fixed: silver mica; 12 mmf ±5%; 500 vdcw
C 50		Same as C 49
E 1	31A890581	BOARD, Terminal: 2 solder lug terminals
		CONNECTORS,
J 2		p/o K 1
J 3		p/o K 1
		RELAY,
K 1	59C483605	Armature: coaxial; 6 vdc; contact arrangement; 1 form "C"; ANTENNA
		COILS,
L 10	24A891063	RF: choke; 1.3 microhenries
L 11	24A891518	RF: Antenna Coupling
L 13	24A801714	RF: Harmonic Filter; .1 microhenries
		RESISTORS,
R 40	6R2013	Fixed: carbon; 27,000 ohm ±10%; 2 w; ins.
R 41	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
		SWITCH,
S 1	40A85655	Toggle: S.P.S.T.; HI-LO
		TUBE,
V 8	829B	Electron
		LINES,
W 1	47B891515	RF Transmission
W 2		Same as W 1
		SOCKET,
X 8	9A893210	Tube: female; 7 contact; steatite base

4. P-8465 Oscillator Deck

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 101	21K6553	Fixed: silver mica; 50 mmf ±10%; 500 vdcw
C 102	21K85882	Fixed: ceramic; 10 mmf ±.5 mmf; 500 vdcw
C 103	19A475604	Variable: air; 7 mmf to 42.8 mmf
C 104	21K401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 105	21R2701	Fixed: silver mica; 150 mmf ±10%; 500 vdcw
		RESISTORS,
R 101		NOT USED
R 102	6R6074	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins.
R 103	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 104	6R6326	Fixed: carbon; 100 ohm ±10%; 1/2 w; ins.
		TUBE,
V 101	6AK6	Electron
		SOCKETS,
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base
X 102	9A30451	Crystal: female; 4 contact; mica filled bakelite base

5. K-8582-A Blank Oscillator Chassis Kit

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 401	21K86229	CAPACITOR, Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw

6. K-8469 Chassis Kit (60 Watt)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
C 20	21R6697	CAPACITOR, Fixed: mica; 200 mmf ±10%; 500 vdcw
		COILS,
L 6	24A891891	RF: PA Grid
L 8	24A891063	RF: choke; 1.3 microhenries
L 9		Same as L 8
		RESISTORS,
R 6	6R6069	Fixed: carbon; 2200 ohm ±10%; 1/2 w; ins.
R 8	6R5736	Fixed: carbon; 47,000 ohm ±10%; 2 w; ins.
R 9		Same as R 8
R 20	6R476012	Fixed: carbon; 3900 ohm ±10%; 2 w; ins.
R 21	6R488136	Fixed: carbon; 2.7 megohm ±10%; 1/2 w; ins.
R 22	6R2099	Fixed: carbon; 100,000 ohm ±10%; 2 w; ins.
R 23	17A83436	Fixed: wire wound; 3000 ohm ±10%; 25 w; ins.
R 38		Same as R 20
R 39		Same as R 20
R 42	6R488158	Fixed: carbon; 22 megohm ±10%; 1/2 w; ins.
R 45	17K892469	Fixed: wire wound; 4 ohm ±2%; 1 w; ins.
	or 17B821901	Fixed: wire wound; 4 ohm ±2%; 3 w; ins.

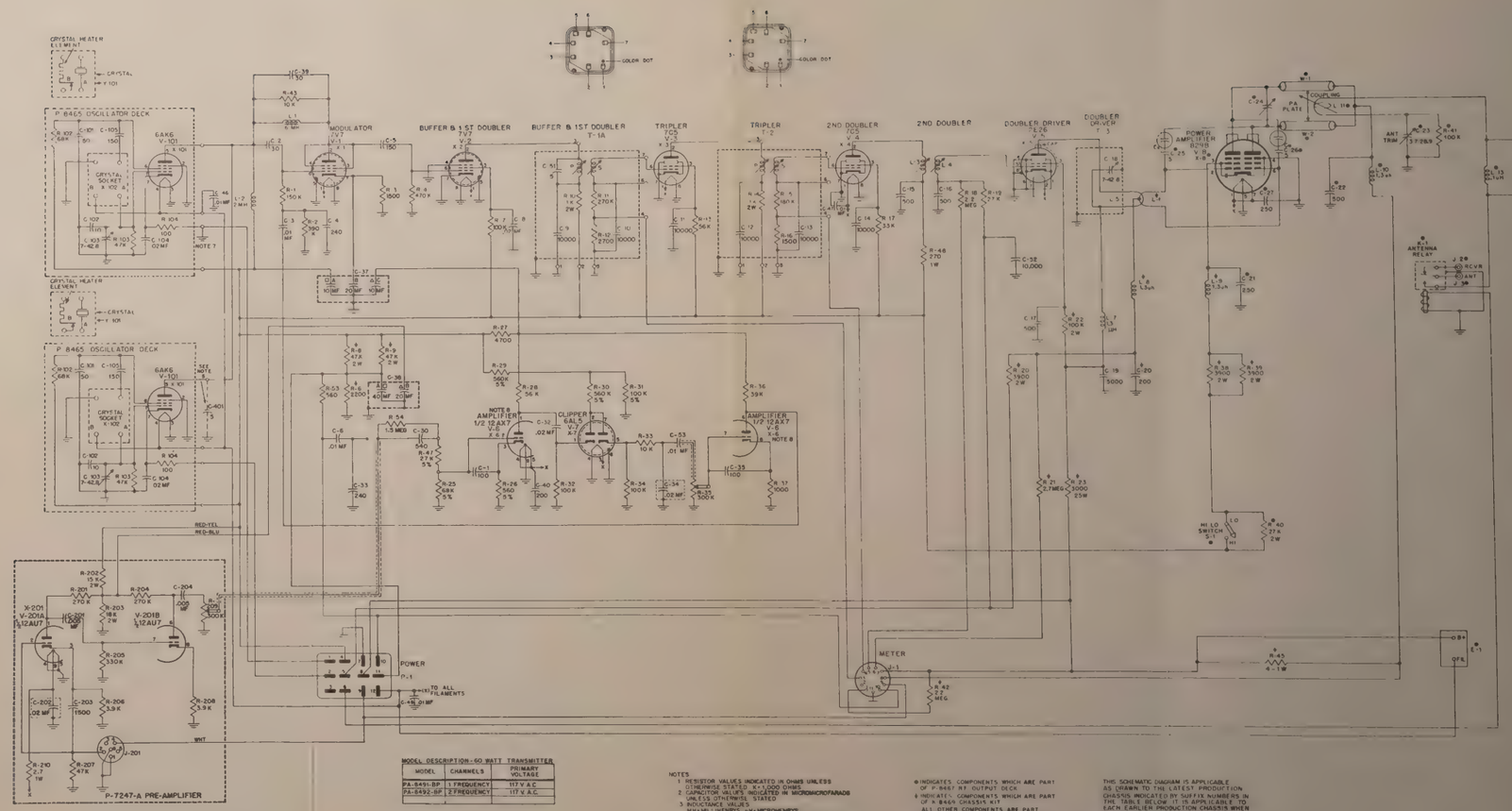
NOTE

Crystal Unit is not part of transmitter unit, and must be ordered separately.

7. Crystals

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
Y 101	1U801426	CRYSTAL UNIT, Quartz: oscillator transmitter; 6300-7300 kc.; MOTOROLA TYPE DO3; with 6 volt heater unit; when ordering frequency must be specified Includes the following CRYSTAL REPLACEMENT PARTS 1U801413 Crystal Unit, quartz: oscillator transmitter; 6300-7300 kc.; MOTOROLA TYPE BO3; when ordering frequency must be specified 1U891880 Heater and Thermostat Assembly: MOTOROLA TYPE DOX; consisting of: 1V891886 Heater and Base Assembly 1C892365 Thermostat, crystal unit or 1C837260 Thermostat, crystal unit 15B891444 Housing, crystal thermostat and heater 64A892473 Plate, crystal unit baffle 41A891451 Ring, crystal housing retainer

152-174 MC. 60 WATT TRANSMITTER CHASSIS WITH PRE-AMPLIFIER SCHEMATIC DIAGRAM


CRYSTAL HEATER ELEMENT
P 8465 OSCILLATOR DECK
6AK5 V-101
CRYSTAL SOCKET
MODULATOR V-1
BUFFER & 1ST DOUBLER T-2
BUFFER & 1ST DOUBLER T-1A
TRIPLER V-3
TRIPLER V-2
2ND DOUBLER V-4
2ND DOUBLER
DOUBLER DRIVER 6J6
DOUBLER DRIVER
POWER AMPLIFIER 829B V-8
PA PLATE
COUPLING
ANT TRIM
ANTENNA RELAY
MODEL DESCRIPTION-60 WATT TRANSMITTER
MODEL
CHANNELS
PRIMARY VOLTAGE
PA-8491-BP
1 FREQUENCY
117 V A.C.
PA-8492-BP
2 FREQUENCY
117 V A.C.
NOTES
1 RESISTOR VALUES INDICATED IN OHMS UNLESS OTHERWISE STATED K=1,000 OHMS
2 CAPACITOR VALUES INDICATED IN MICROMICROFARADS UNLESS OTHERWISE STATED
3 INDUCTANCE VALUES MH=MILLIHENRYS, UH=MICROHENRYS
4 CONNECTORS SHOWN AS VIEWED FROM WIRING SIDE.
5 CAPACITOR C-401 IS K-8582-A DUMMY OSC. DECK
6 THIS SYMBOL INDICATES NEUTRALIZING CAPACITY INHERENT BY MECHANICAL ASSEMBLY
7 GROUND CONNECTION USED ONLY FOR ONE FREQ. SWITCH (PA-8491-BP) GROUND MUST BE REMOVED WHEN TWO OR MORE FREQ. ARE USED.
R 12AX7 MAY BE REPLACED BY 12A7
INDICATES COMPONENTS WHICH ARE PART OF P-8467 RF OUTPUT DECK
INDICATES COMPONENTS WHICH ARE PART OF K-8469 CHASSIS KIT
ALL OTHER COMPONENTS ARE PART OF P-8430-A BASIC CHASSIS
THIS SCHEMATIC DIAGRAM IS APPLICABLE AS DRAWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN THE CHART BELOW. IT IS CURRENT TO EACH EARLIER PRODUCTION CHASSIS WHEN AMENDED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS
CHASSIS
DESIGN NUMBERS
LATEST VERSION
PA-8491-BP
PA-8492-BP
P-7247-A PRE-AMPLIFIER

MOTOROLA
PART NO. 63E802343
ISSUE - L 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

NOTE

This parts list is arranged by kits, i.e., basic chassis, RF decks, etc. When ordering replacement parts specify part number, description, schematic diagram number, diagram issue, and reference symbol of the part.

PA-8491-BP and PA-8492-BP

Reference: Schematic Diagram 63E802343

1. P-8430-A Strip Transmitter Chassis (Basic)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	21R6631	Fixed: silver mica; 100 mmf ±10% ±10%; 500 vdcw
C 2	21R2733	Fixed: silver mica; 30 mmf ±10%; 500 vdcw
C 3	21A801139	Fixed: ceramic; disc; .01 mf +80-20%; 600 vdcw
C 4	21R6662	Fixed: mica; 240 mmf ±10%; 500 vdcw
C 5	21R2701	Fixed: silver mica; 150 mmf ±10% 500 vdcw
	or 21R6527	Fixed: silver mica; 150 mmf ±10% 500 vdcw
C 6		Same as C 3
C 7		NOT USED
C 8	21R401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 11		Same as C 3
C 14		Same as C 3
C 15	21A881306	Fixed: ceramic; 500 mmf ±10%; 500 vdcw
C 16		Same as C 15
C 17		Same as C 15
C 19	21K893343	Fixed: mica; 5000 mmf ±20%; 1000 vdcw
C 30	21K803505	Fixed: silver mica; 540 mmf ±3%; 500 vdcw
C 32		Same as C 8
C 33		Same as C 4
C 34	8K836754	Fixed: oil filled; tubular; .02 mf ±10%; 400 vdcw
C 35		Same as C 1
C 37	23K892117	Fixed: electrolytic; 3 section; consisting of:
C 37A		□ 10 mf +50-10%; 450 vdcw; section
C 37B		20 mf +100-10%; 25 vdcw; section
C 37C		△ 10 mf +50-10%; 450 vdcw; section
C 38	23K832217	Fixed: electrolytic; 2 section; consisting of:
C 38A		□ 40 mf +100-10%; 150 vdcw
C 38B		△ 20 mf +100-10%; 150 vdcw
C 39		Same as C 2
C 40	21R2748	Fixed: mica; 2000 mmf ±10%; 500 vdcw
C 46		Same as C 3
C 47		Same as C 3
C 48		Same as C 3
C 52		Same as C 3
C 53		Same as C 3
		CONNECTOR,
J 1	9B86864	Receptacle: female; 11 contact; polarized; round; black plastic base; does not include 42A821428 RING, connector retainer; which must be ordered separately; METER

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		COILS, RF:
L 1	24K483466	Choke; 6 millihenries
L 2	24A483465	Choke; 2 millihenries
L 7	24A891063	Choke; 1.3 microhenries
		CONNECTOR,
P 1	28A483376	Receptacle: male; 12 contact; polarized; rectangular; black phenolic base; saddle mounting; POWER
		RESISTORS,
R 1	6R6398	Fixed: carbon; 150,000 ohm ±10%; 1/2 w; ins.
R 2	6R5646	Fixed: carbon; 390,000 ohm ±10%; 1/2 w; ins.
R 3	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.
R 4	6R6377	Fixed: carbon; 470,000 ohm ±10%; 1/2 w; ins.
R 5		NOT USED
R 7	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
R 13	6R6378	Fixed: carbon; 56,000 ohm ±10%; 1/2 w; ins.
R 17	6R6410	Fixed: carbon; 33,000 ohm ±10%; 1/2 w; ins.
R 18	6R6433	Fixed: carbon; 2.2 megohm ±10%; 1/2 w; ins.
R 19	6R6434	Fixed: carbon; 27,000 ohm ±10%; 1/2 w; ins.
R 25	6R6479	Fixed: carbon; 68,000 ohm ±5%; 1/2 w; ins.
R 26	6R400058	Fixed: carbon; 560 ohm ±5%; 1/2 w; ins.
R 27	6R6080	Fixed: carbon; 4700 ohm ±10%; 1/2 w; ins.
R 28		Same as R 13
R 29	6R5796	Fixed: carbon; 560,000 ohm ±5%; 1/2 w; ins.
R 30		Same as R 29
R 31	6R5553	Fixed: carbon; 100,000 ohm ±5%; 1/2 w; ins.
R 32		Same as R 7
R 33	6R6320	Fixed: carbon; 10,000 ohm ±10%; 1/2 w; ins.
R 34		Same as R 7
R 35	18K892291	Variable: carbon; 300,000 ohm ±20%
R 36	6R6487	Fixed: carbon; 39,000 ohm ±10%; 1/2 w; ins.
R 37	6R6229	Fixed: carbon; 1000 ohm ±10%; 1/2 w; ins.
R 43		Same as R 33
R 47	6R5786	Fixed: carbon; 27,000 ohm ±5%; 1/2 w; ins.
R 48	6R6336	Fixed: carbon; 270 ohm ±10%; 1 w; ins.
R 53	6R6291	Fixed: carbon; 560 ohm ±10%; 1/2 w; ins.
R 54	6R6460	Fixed: carbon; 1.5 megohm ±10%; 1/2 w; ins.
		TUBES,
V 1	7V7	Electron
V 2		Same as V 1
V 3	7C5	Electron
V 4		Same as V 3
V 5	2E26	Electron
V 6	12AX7	Electron
	or12AT7	Electron
V 7	6AL5	Electron
		SOCKETS,
X 1	9A83952	Tube: female; 8 contact, mica filled phenolic base; saddle mounting
X 2		Same as X 1

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		SOCKETS,
X 3		Same as X 1
X 4		Same as X 1
X 5	9A890001	Tube: female; 8 contact; brown and tan bakelite wafer base saddle mounting
X 6	9K832481	Tube: female; 9 contact; miniature; black phenolic base; saddle mounting; includes center shield and tube shield base
X 7	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base; saddle mounting; includes center shield and tube shield base

2. K-8432 Coil Kit (p/o P-8430-A)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 9	21A801139	Fixed: ceramic; .01 mf +80-20%; 600 vdcw; disc; p/o T 1A
C 10		Same as C 9; p/o T 1A
C 12		Same as C 9 except p/o T 2
C 13		Same as C 9 except p/o T 2
C 18	19A475604	Variable; air; 7 mmf to 42.8 mmf; p/o T 3
C 51	21A813136	Fixed: ceramic; 5 mmf 1.5 mmf; 500 vdcw; p/o T 1A
		COILS, RF:
L 3	1V85835	2nd Doubler Plate
L 4	1V892523	Doubler Driver Grid
L 5	24B483514	Doubler Driver Plate; p/o T 3
		RESISTORS,
R 10	6R3922	Fixed: carbon; 1000 ohm ±10%; 2 w; ins.; p/o T 1A
R 11	6R6414	Fixed: carbon; 270,000 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 12	6R5577	Fixed: carbon; 2700 ohm ±10%; 1/2 w; ins.; p/o T 1A
R 14		Same as R 10 except p/o T 2
R 15	6R6444	Fixed: carbon; 180,000 ohm ±10%; 1/2 w; ins.; p/o T 2
R 16	6R6038	Fixed: carbon; 1500 ohm ±10%; 1/2 w; ins.; p/o T 2
		COILS, RF:
T 1A	24B813173	Buffer and 1st Doubler
T 2	24B881294	Tripler
T 3	1V880036	Doubler Driver

3. P-8467 RF Output Deck (60 Watt)

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 21	1A84707	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 22	21K891905	Fixed: mica; 500 mmf ±20%; 200 vdcw
C 23	19A84648	Variable: air; 3.7 mmf to 28.9 mmf; ANTENNA
C 24		Variable: air; consisting of: 51A483511 PLATE, capacitor; and screw (2 required for capacitance)
C 25	21K86229	Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw
C 26		Same as C 25
C 27	1K84708	Fixed: silver mica; 250 mmf ±10% 850 vdcw; includes terminal lug
C 49	21R2788	Fixed: silver mica; 12 mmf ±5%; 500 vdcw
C 50		Same as C 49
		BOARD,
E 1	31A890581	Terminal: 2 solder lug terminals

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CONNECTORS,
J 2		p/o K 1
J 3		p/o K 1
		RELAY,
K 1	59C483605	Armature: coaxial; 6 VDC; contact arrangement; 1 form "C"; ANTENNA
		COILS, RF:
L 10	24A891063	Choke; 1.3 microhenries
L 11	24A891518	Antenna Coupling
L 13	24A801714	Harmonic Filter; .1 microhenries
		RESISTORS,
R 40	6R2013	Fixed: carbon; 27,000 ohm ±10%; 2 w; ins.
R 41	6R6031	Fixed: carbon; 100,000 ohm ±10%; 1/2 w; ins.
		SWITCH,
S 1	40A85655	Toggle: S.P.S.T.; HI-LO
		TUBE,
V 8	829B	Electron
		LINES,
W 1	47B891515	RF Transmission
W 2		Same as W 1
		SOCKET,
X 8	9A893210	Tube: female; 7 contact; steatite base

4. P-8465 Oscillator Deck

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITORS,
C 101	21K6553	Fixed: silver mica; 50 mmf ±10%; 500 vdcw
C 102	21K85882	Fixed: ceramic; 10 mmf ±.5 mmf; 500 vdcw
C 103	19A475604	Variable; air; 7 mmf to 42.8 mmf
C 104	21K401029	Fixed: ceramic; disc; .02 mf +80-20%; 500 vdcw
C 105	21R2701	Fixed: silver mica; 150 mmf ±10% 500 vdcw
		RESISTORS,
R 101		NOT USED
R 102	6R6074	Fixed: carbon; 68,000 ohm ±10%; 1/2 w; ins.
R 103	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 104	6R6326	Fixed: carbon; 100 ohm ±10%; 1/2 w; ins.
		TUBE,
V 101	6AK6	Electron
		SOCKETS,
X 101	9B834083	Tube: female; 7 contact; miniature; mica filled phenolic base saddle mounting; includes center shield and tube shield base
X 102	9A30451	Crystal: female; 4 contact; mica filled bakelite base

5. K-8482-A Blank Oscillator Chassis Kit

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITOR,
C 401	21K86229	Fixed: ceramic; 5 mmf ±.5 mmf; 500 vdcw

6. K-8469 Chassis Kit (60 Watt)

REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CAPACITOR,
C 20	21R6697	Fixed: mica; 200 mmf ±10%; 500 vdcw

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		COILS, RF:
L 6	24A891891	PA Grid
L 8	24A891063	Choke; 1.3 microhenries
L 9		Same as L 8
		RESISTORS,
R 6	6R6069	Fixed: carbon; 2200 ohm ±10%; 1/2 w; ins.
R 8	6R5736	Fixed: carbon; 47,000 ohm ±10%; 2 w; ins.
R 9		Same as R 8
R 20	6R476012	Fixed: carbon; 3900 ohm ±10%; 2 w; ins.
R 21	6R488136	Fixed: carbon; 2.7 megohm ±10%; 1/2 w; ins.
R 22	6R2099	Fixed: carbon; 100,000 ohm ±10%; 2 w; ins.
R 23	17A83436	Fixed: wire wound; 3000 ohm ±10%; 25 w; ins.
R 38		Same as R 20
R 39		Same as R 20
R 42	6R488158	Fixed: carbon; 22 megohm ±10%; 1/2 w; ins.
R 45	17K892469	Fixed: wire wound; 4 ohm ±2%; 1 w; ins.
	or 17B821901	Fixed: wire wound; 4 ohm ±2%; 3 w; ins.

7. P-7247-A Pre-Amplifier

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 201	21R115312	Fixed: ceramic; disc; .005 mf min. +100%; max.; 500 vdcw
C 202	8K85984	Fixed; oil filled; .02 mf ±20%; 400 vdcw; tubular
C 203	21B800801	Fixed: ceramic; disc; .0015 mf GMV +100% max.; 500 vdcw
C 204		Same as C 201
		CONNECTOR,
J 201	9A881071	Receptacle: female; 6 contact; polarized; round; black phenolic insulator
		RESISTORS,
R 201	6R6414	Fixed: carbon; 270,000 ohm ±10%; 1/2 w; ins.
R 202	6R5732	Fixed: carbon; 15,000 ohm ±10%; 2 w; ins.
R 203	6R476014	Fixed: carbon; 18,000 ohm ±10%; 2 w; ins.
R 204		Same as R 201
R 205	6R2096	Fixed: carbon; 330,000 ohm ±10%; 1/2 w; ins.
R 206	6R5659	Fixed: carbon; 3900 ohm ±10%; 1/2 w; ins.
R 207	6R6048	Fixed: carbon; 47,000 ohm ±10%; 1/2 w; ins.
R 208		Same as R 206
R 209	18A893454	Variable: carbon; 300,000 ohm ±20%; 1/4 w.
R 210	17A890468	Fixed: wire wound; 2.7 ohm ±10%; 1 w; ins.
		TUBE,
V 201	12AU7	Electron
		SOCKET,
X 201	9B881243	Tube: female; 9 contact; miniature; mica filled base; saddle mounting; includes center shield and tube shield base

NOTE

Crystal Unit is not part of transmitter unit, and must be ordered separately.

8. Crystals

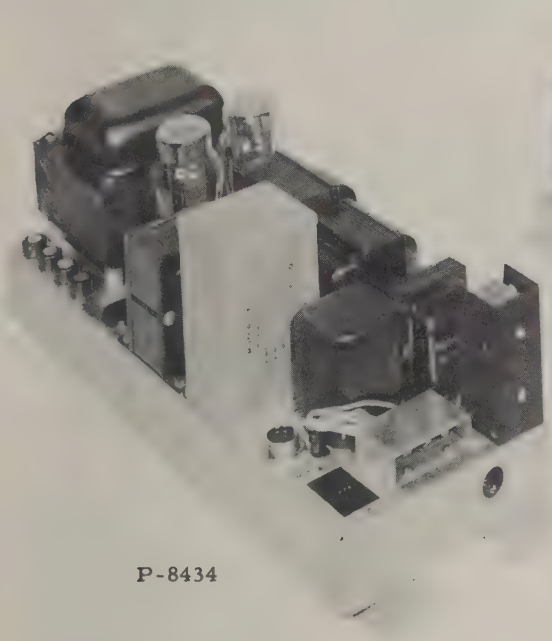
REFERENCE SYMBOL	MOTOROLA PART No	DESCRIPTION
		CRYSTAL UNIT,
Y 101	1U801426	Quartz: oscillator transmitter; 6300-7300 kc.; MOTOROLA TYPE DO3; with 6 volt heater unit; when ordering frequency must be specified
		Includes the following CRYSTAL REPLACEMENT PARTS:
		1U801413 Crystal Unit; quartz: oscillator transmitter; 6300-7300 kc.; MOTOROLA TYPE BO3; when ordering frequency must be specified
		1U891880 Heater and Thermostat Assembly: MOTOROLA TYPE DOX; consisting of:
		1V891886 Heater and Base Assembly
		1C892365 Thermostat, crystal unit
		or 1C837260 Thermostat, crystal unit
		15B891444 Housing, crystal, thermostat and heater
		64A892473 Plate, crystal unit baffle
		41A891451 Ring, crystal housing retainer

Motorola®

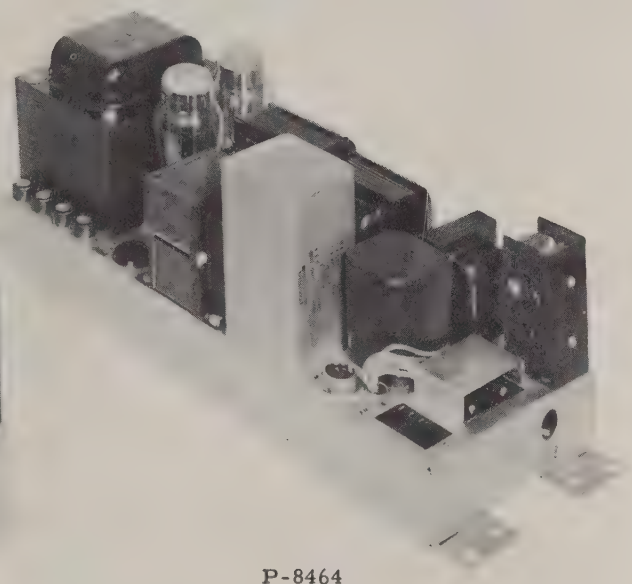
THE "RESEARCH" LINE

AC POWER SUPPLY CHASSIS

117 VAC, 60 CYCLE OPERATION



P-8434



P-8464

MODEL	APPLICATION
P-8434	30 Watt Transmitter & One Receiver
P-8464	60 Watt Transmitter & One Receiver
P-8434-R	Special Applications
P-8464-R	Special Applications

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

Printed in U.S.A.
10/54-CP

54P891688
Issue - J

DESCRIPTION

Each of the MOTOROLA AC operated power supply chassis described herein provides all of the voltages necessary for operation of a complete transmitter and single receiver installation. Remotely controlled "BR" and "BYR" models and locally controlled "BL" and "BY" models employ identical power supply chassis. The specific power supply version used depends upon the rated RF power output of the associated transmitter (see specifications).

Adequate primary overload protection of the transmitter, receiver and relay power circuits is provided by five (5) cartridge type replaceable fuses. A pair of type 5R4GY vacuum tube diodes are connected for full wave rectification to provide the required transmitter high voltages. Selenium full wave rectifiers are employed in the receiver and relay power circuits.

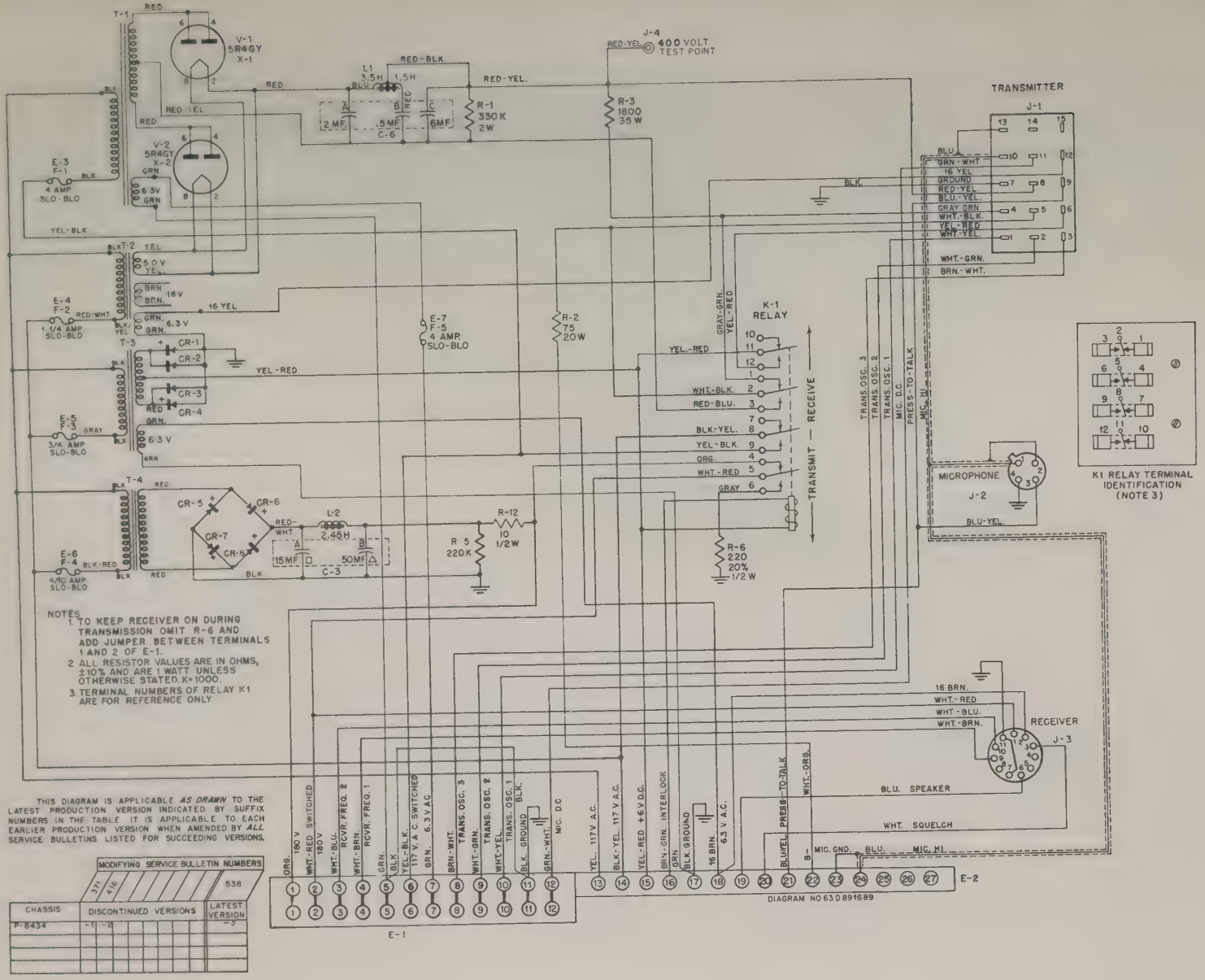
In addition to the rectifier circuits, the power supply chassis contains a microphone connector for local transmitter operation and a transmit-receive relay which provides the necessary receiver B+ muting facilities.

The P-8434-R and P-8464-R Power Supplies are modifications of the standard P-8434 and P-8464 Power Supplies, respectively. The modification permits the receiver to remain "on" during the transmission period of the associated transmitter.

NOMINAL PERFORMANCE SPECIFICATIONS

BASIC UNIT	P-8434 P-8434-R	P-8464 P-8464-R
USED WITH "BL", "BR", "BY" OR "BYR" MODELS	30 Watt transmitter-single or #1 receiver	60 Watt transmitter-single or #1 receiver
PRIMARY POWER SOURCE	117 volts, 60 cycle, single phase, 2 wire	
TUBE COMPLEMENT	Two 5R4GY RECTIFIERS	
OUTPUT RATINGS	Transmitter Section: 420 VDC at 200 ma. 250 VDC at 80 ma. 6.3 VAC at 10.5 A 6 VDC at 1 A Receiver Section: 180 VDC at 55 ma.	Transmitter Section: 620 VDC at 290 ma. 250 VDC at 80 ma. 6.3 VAC at 10.5 A 6 VDC at 1 A Receiver Section: 180 VDC at 55 ma.
DIMENSIONS	19" long x 6-1/4" wide x 6-1/4" high	19" long x 6-1/4" wide x 7-1/4" high
WEIGHT	31 lbs.	38 lbs.
MOUNTING	Standard 19" rack installation	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.



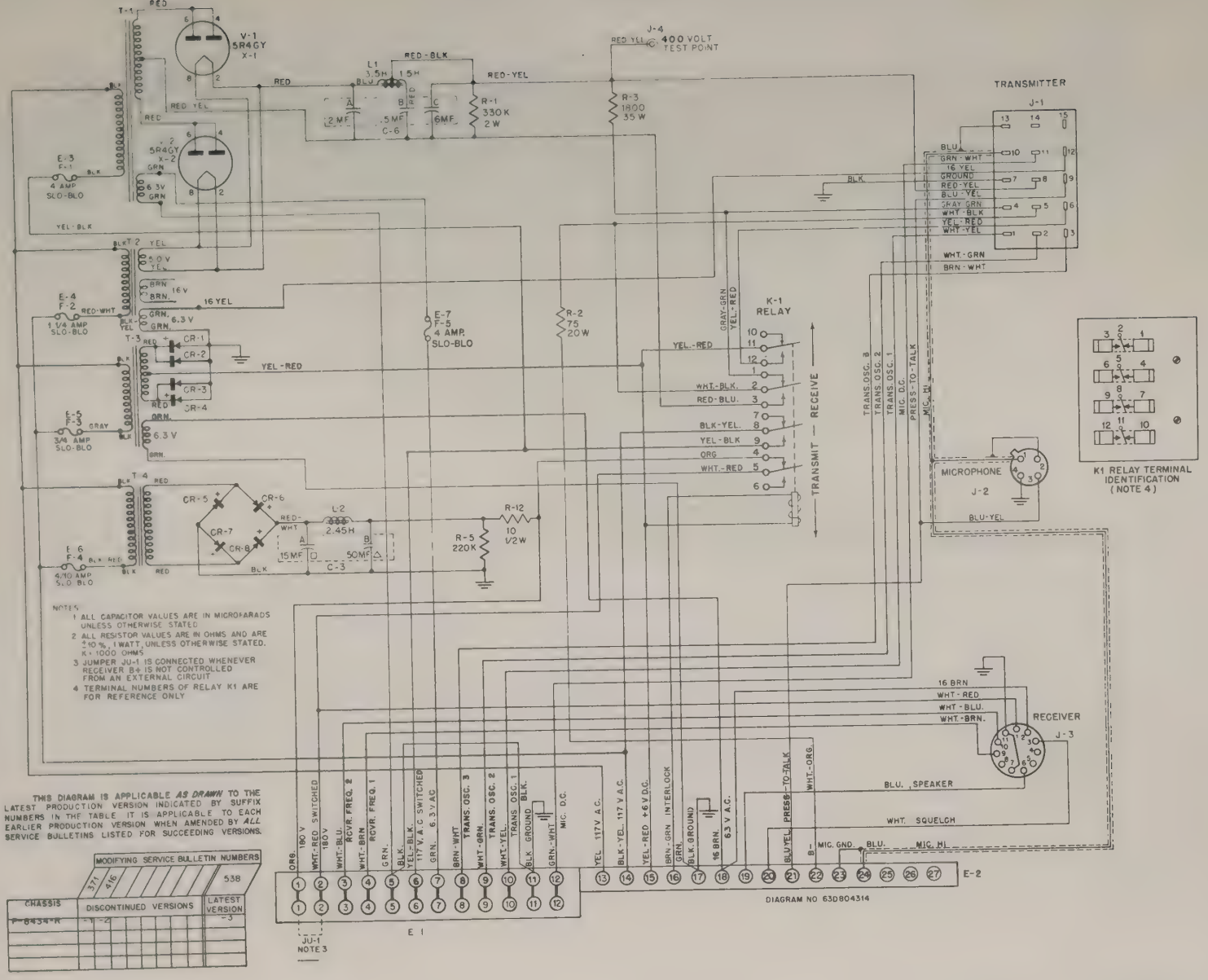
MOTOROLA
PART NO. 63D891689
ISSUE - P 10/54-CP

P-8434 AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST
AC POWER SUPPLY

Reference:
Schematic Diagram
63D890204

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1		NOT USED
C 2		NOT USED
C 3	23K890493	Fixed: electrolytic; 2 section; consisting of:
C 3A		□ 15 mf +50-10%; 350 vdcw; section
C 3B		△ 50 mf +50-10%; 300 vdcw; section
C 4		NOT USED
C 5		NOT USED
C 6	8C892621	Fixed: oil filled; 3 section; consisting of:
C 6A		2 mf +20-10%; 1000 vdcw; section
C 6B		.5 mf +20-10%; 1000 vdcw; section
C 6C		6 mf +20-10%; 800 vdcw; section
		RECTIFIERS,
CR 1	48B890348	Metallic: selenium; 1 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
CR 5	48B478111	Metallic: selenium; 6 plate
CR 6		Same as CR 5
CR 7		Same as CR 5
CR 8		Same as CR 5
		BOARDS,
E 1	31B880805	Terminal: 12 double screw terminals
E 2	31B892834	Terminal: 15 single screw terminals
		HOLDERS,
E 3	9B820279	Fuse: single fuse; insert type; for 1-1/4" long x 1/4" dia. fuse
E 4		Same as E 3
E 5		Same as E 3
E 6		Same as E 3
E 7	31A824974	Fuse: single fuse; clip type; for 1-1/4" long x 1/4" dia. fuse
		FUSES,
F 1	65K817956	Cartridge: one time; slo-blo; glass; 5 ampere; 125 volt; 1-1/4" long 1/4" diameter
F 2	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 3	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 4	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 5		Same as F 1
		CONNECTORS,
J 1	9A891537	Receptacle: female; 15 contacts; polarized; rectangular; black bakelite base; XMTR
J 2	9B16345	Receptacle: female; 4 contact; polarized; round phenolic insulator MICROPHONE
J 3	9B86864	Receptacle: female; 11 contacts; round; black plastic base; does not include 42A821428 RING, CONNECTORS, connector retainer, which must be ordered separately; RECEIVER
J 4	9K81685	Receptacle: female; 1 contact; coded; BLACK
		RELAY,
K 1	59B890907	Armature: 6 vdc; contact arrangement; 4 form "C"; TRANSMIT-RECEIVE
		REACTORS,
L 1	25C892463	Filter; tapped at 1.5 henries and 3.5 henries
L 2	25K87302	Filter; 2.45 henries
		RESISTORS,
R 1	6R490002	Fixed: carbon; 330,000 ohms ±10%; 2 w; ins.
R 2	17K475245	Fixed: wire-wound; 75 ohms ±10%; 20 w; ins.
R 3	17B892965	Fixed: wire-wound; 1800 ohm ±10%; 35 w.
R 4		NOT USED
R 5	6R5574	Fixed: carbon; 220,000 ohm ±10%; 1 w; ins.
R 6	6R3933	Fixed: carbon; 220 ohm ±10%; 1/2 w; ins.
R 7		Same as R 3
R 8	6R488026	Fixed: carbon; 22 ohm ±10%; 1 w; ins.
R 9		Same as R 8
R 10		Same as R 8
R 11		Same as R 8
R 12	6R5621	Fixed: carbon; 10 ohm ±10%; 1/2 w; ins.
		TRANSFORMERS,
T 1	25C891906	Power: primary, 117 volts; 50-60 cycles; secondary; 670 volts at 370 ma; center tapped, secondary, 6.3 volts at 1 ampere
	or 25C821986	Power: primary; 117 volt; 50-60 cycles; secondary; 670 volt DC at 370 ma; secondary; center tapped; 6.3 volt at 1 ampere
T 2	25B483001	Power: filament; primary; 117 volts 50-60 cycles; secondary; 16 volts at .75 ampere; secondary, 6.3 volts at 5 ampere; secondary 5 volts at 6 ampere
	or 25C812731	Power: filament; primary, 117 volts; 50-60 cycles; secondary; 16 volts at .75 ampere; secondary; 6.3 volts at 5 amp. secondary 5 volts at 6 amp.
T 3	25C891531	Power: relay supply; primary; 117 volts; 50-60 cycles; secondary; 8.5 volts at 1 ampere each side of center tap; secondary; 6.3 volts at 4.5 ampere
T 4	25B813404	Power: plate; primary, 117 volt; 50-60 cycles; secondary; 200 volts at 55 ma.
		TUBES,
V 1	5R4GY	Electron
V 2		Same as V 1
		SOCKETS,
X 1	9B6763	Tube: female; 8 contact; molded black bakelite base; saddle mounting
X 2		Same as X 1



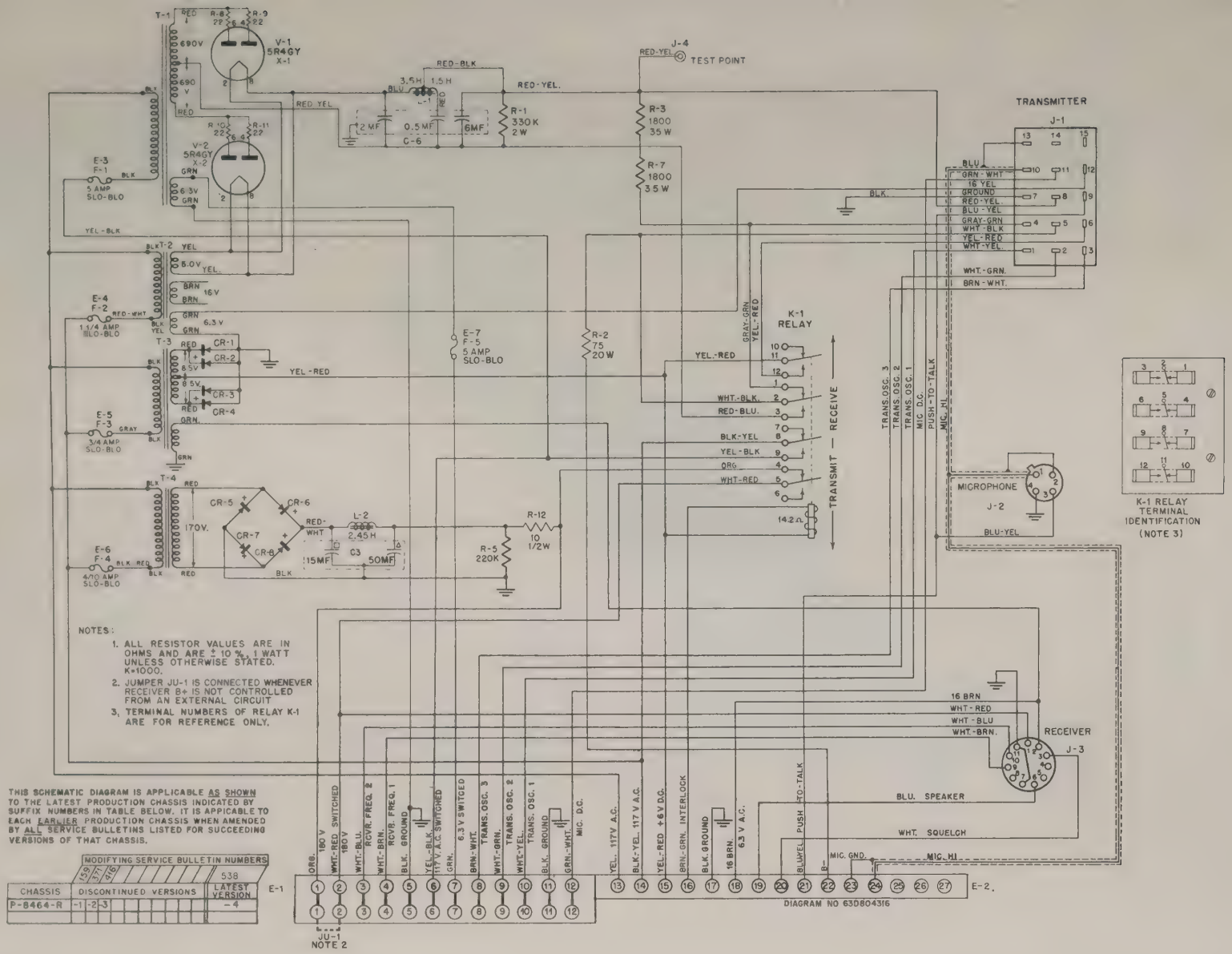
MOTOROLA
PART NO. 63D804314
ISSUE - G 10/54-CP

P-8434-R AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST
AC POWER SUPPLY

Reference:
Schematic Diagram
63D804314

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1		NOT USED
C 2		NOT USED
C 3	23K890493	Fixed: electrolytic; 2 section; consisting of:
C 3A		□ 15 mf +50-10%; 350 vdcw; section
C 3B		△ 50 mf +50-10%; 300 vdcw; section
C 4		NOT USED
C 5		NOT USED
C 6	8C892621	Fixed: oil filled; 3 section; consisting of:
C 6A		2 mf +20-10%; 1000 vdcw; section
C 6B		.5 mf +20-10%; 1000 vdcw; section
C 6C		6 mf +20-10%; 800 vdcw; section
		RECTIFIERS,
CR 1	48B890348	Metallic: selenium; 1 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
CR 5	48B478111	Metallic: selenium; 6 plate
CR 6		Same as CR 5
CR 7		Same as CR 5
CR 8		Same as CR 5
		BOARDS,
E 1	31B880805	Terminal: 12 double screw terminals
E 2	31B892834	Terminal: 15 single screw terminals
		HOLDERS,
E 3	9B820279	Fuse: single fuse; insert type; for 1-1/4" long x 1/4" diameter fuse
E 4		Same as E 3
E 5		Same as E 3
E 6		Same as E 3
E 7	31A824974	Fuse: single fuse; clip type; for 1-1/4" long x 1/4" diameter fuse
		FUSES,
F 1	65K834464	Cartridge: one time; slo-blo; glass; 4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 2	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 3	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 4	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 5		Same as F 1
		CONNECTORS,
J 1	9A891537	Receptacle: female; 15 contacts; polarized; rectangular; black bakelite base; TRANSMITTER
J 2	9B16345	Receptacle: female; 4 contact; polarized; round phenolic insulator; MICROPHONE
J 3	9B86864	Receptacle: female; 11 contacts; round; black plastic base; does not include 42A821428 RING, connector retainer; which must be ordered separately; RECEIVER
J 4	9K81685	Receptacle: female; 1 contact; coded BLACK
		LEAD,
JU 1	1V801456	Electrical: jumper; consisting of: 10M430 WIRE, electrical: #20 ga. stranded; insulated; coded BLACK 2-1/2" long required; 29R5241 LUG, terminal: #8S; 2 required
		RELAY,
K 1	59B890907	Armature: 6 vdc; contact arrangement; 4 form "C"; TRANSMIT-RECEIVE
		REACTORS,
L 1	25C892463	Filter; tapped at 1.5 henries and 3.5 henries
L 2	25K87302	Filter; 2.45 henries
		RESISTORS,
R 1	6R490002	Fixed: carbon; 330,000 ohms ±10%; 2 w; ins.
R 2	17K475245	Fixed: wire-wound; 75 ohms ±10%; 20 w; ins.
R 3	17B892965	Fixed: wire-wound; 1800 ohm ±10%; 35 w.
R 4		NOT USED
R 5	6R5574	Fixed: carbon; 220,000 ohm ±10%; 1 w; ins.
R 12	6R5621	Fixed: carbon; 10 ohm ±10%; 1/2 w; ins.
		TRANSFORMERS,
T 1	25B84881	Power: primary; 117 volts; 50-60 cycles; secondary; 420 volts at 290 ma.; center tapped; secondary, 6.3 volts at 1 amp
	or 25C821424	Power: primary; 117 volt; 60 cycle; secondary; 450 volt DC at 290 ma.; center tapped; secondary; 6.3 volt at 1 ampere
T 2	25B483001	Power: filament; primary, 117 volts 50-60 cycles; secondary; 16 volts at .75 ampere; secondary, 6.3 volts at 5 ampere; secondary 5 volts at 6 ampere
	or 25C812731	Power: filament; primary 117 volts; 50-60 cycles; secondary; 16 volts at .75 ampere; secondary; 6.3 volts at 5 ampere; secondary 5 volts at 6 ampere
T 3	25C891531	Power: relay supply; primary; 117 volts; 50-60 cycles; secondary; 8.5 volts at 1 ampere each side of center tap; secondary; 6.3 volts at 4.5 ampere
T 4	25B813404	Power: plate; primary; 117 volt; 50-60 cycles; secondary; 200 volts at 55 ma.
		TUBES,
V 1	5R4GY	Electron
V 2		Same as V 1
		SOCKETS,
X 1	9B6763	Tube: female; 8 contact; molded black bakelite base; saddle mounting
X 2		Same as X 1



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS AND ARE ± 10 %, 1 WATT UNLESS OTHERWISE STATED. K=1000.
2. JUMPER JU-1 IS CONNECTED WHENEVER RECEIVER B+ IS NOT CONTROLLED FROM AN EXTERNAL CIRCUIT
3. TERMINAL NUMBERS OF RELAY K-1 ARE FOR REFERENCE ONLY.

THIS SCHEMATIC DIAGRAM IS APPLICABLE AS SHOWN TO THE LATEST PRODUCTION CHASSIS INDICATED BY SUFFIX NUMBERS IN TABLE BELOW. IT IS APPICABLE TO EACH EARLIER PRODUCTION CHASSIS WHEN AMENDED BY ALL SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS OF THAT CHASSIS.

CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS: DISCONTINUED VERSIONS (15, 771, 816)	LATEST VERSION (538)
P-8464-R	-1 -2 -3	-4

MOTOROLA
PART NO. 63D804316
ISSUE - G 10/54-CP

P-8464-R AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST
AC POWER SUPPLY

Reference:
Schematic Diagram
63D804316

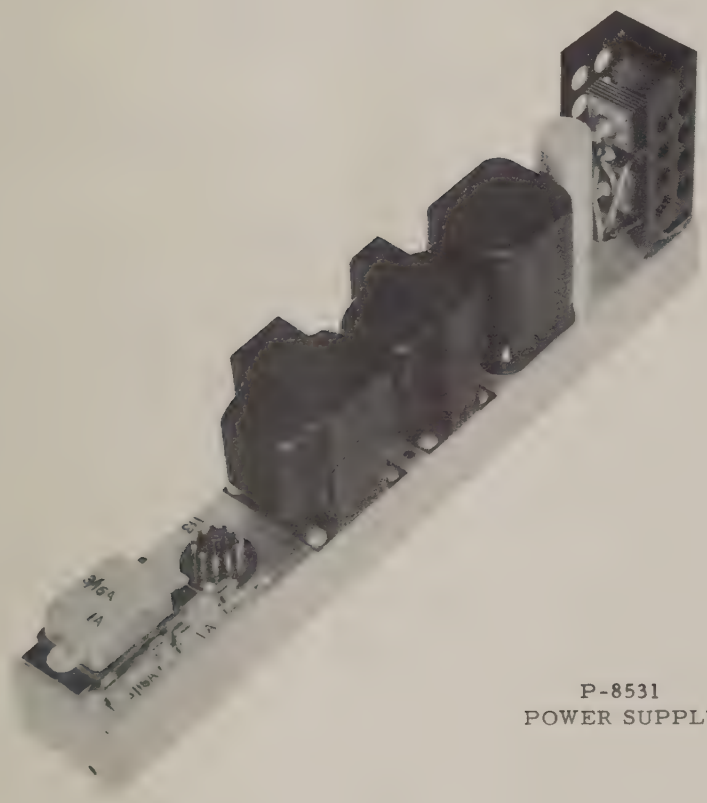
REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1		NOT USED
C 2		NOT USED
C 3	23K890493	Fixed: electrolytic; 2 section; consisting of:
C 3A		□15 mf +50-10%; 350 vdcw; section
C 3B		△50 mf +50-10%; 300 vdcw; section
C 4		NOT USED
C 5		NOT USED
C 6	8C892621	Fixed: oil filled; 3 section; consisting of:
C 6A		2 mf +20-10%; 1000 vdcw; section
C 6B		.5 mf +20-10%; 1000 vdcw; section
C 6C		6 mf +20-10%; 800 vdcw; section
		RECTIFIERS,
CR 1	48B890348	Metallic: selenium; 1 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
CR 5	48B478111	Metallic: selenium; 6 plate
CR 6		Same as CR 5
CR 7		Same as CR 5
CR 8		Same as CR 5
		BOARDS,
E 1	31B880805	Terminal: 12 double screw terminals
E 2	31B892834	Terminal: 15 single screw terminals
		HOLDERS,
E 3	9B820279	Fuse: single fuse; insert type; for 1-1/4" long x 1/4" dia. fuse
E 4		Same as E 3
E 5		Same as E 3
E 6		Same as E 3
E 7	31A824974	Fuse: single fuse; clip type; for 1-1/4" long x 1/4" dia. fuse
		FUSES,
F 1	65K817956	Cartridge: one time; slo-blo; glass; 5 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 2	65K834466	Cartridge: one time; slo-blo; glass; 1.25 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 3	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 4	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 5		Same as F 1
		CONNECTORS,
J 1	9A891537	Receptacle: female; 15 contacts; polarized; rectangular; black bakelite base; XMTR
J 2	9B16345	Receptacle: female; 4 contact; polarized; round phenolic insulator; MICROPHONE
J 3	9B86864	Receptacle: female; 11 contacts; round; black plastic base; does not include 42A821428 RING, connector retainer, which must be ordered separately RECEIVER
J 4	9K81685	CONNECTOR, Receptacle: female; 1 contact; coded; BLACK
		LEAD,
JU 1	1V801456	Electrical: jumper; consisting of: 10M430 WIRE, electrical: #20 ga stranded; insulated; coded BLACK 2-1/2" long required 29R5241 LUG, terminal: #8S; 2 required
		RELAY,
K 1	59B890907	Armature: 6 vdc; contact arrangement; 4 form "C"; TRANSMIT-RECEIVE
		REACTORS,
L 1	25C892463	Filter; tapped at 1.5 henries and 3.5 henries
L 2	25K87302	Filter: 2.45 henries
		RESISTORS,
R 1	6R490002	Fixed: carbon; 330,000 ohms ±10%; 2 w; ins.
R 2	17K475245	Fixed: wire-wound; 75 ohms ±10%; 20 w; ins.
R 3	17B892965	Fixed: wire-wound; 1800 ohm ±10%; 35 w.
R 4		NOT USED
R 5	6R5574	Fixed: carbon; 220,000 ohm ±10%; 1 w; ins.
R 7		Same as R 3
R 8	6R488026	Fixed: carbon; 22 ohm ±10%; 1 w; ins.
R 9		Same as R 8
R 10		Same as R 8
R 11		Same as R 8
R 12	6R5621	Fixed: carbon; 10 ohm ±10%; 1/2 w; ins.
		TRANSFORMERS,
T 1	25C891906	Power: primary, 117 volts; 50-60 cycles; secondary; 670 volts at 370 ma. center tapped; secondary 6.3 v. at 1 amp.
	or 25C821986	Power: primary; 117 volt; 50-60 cycle; secondary; 670 volt DC at 370 ma.; secondary; center tapped; 6.3 volt at 1 ampere
T 2	25B483001	Power: filament; primary, 117 volts; 50-60 cycles; secondary; 16 volts at .75 ampere; secondary, 6.3 volts at 5 amp secondary 5 volts at 6 amp.
	or 25C812731	Power: filament; primary, 117 volts; 50-60 cycles; secondary; 16 volts at .75 ampere; secondary; 6.3 volts at 5 ampere; secondary 5 volts at 6 ampere
T 3	25C891531	Power: relay supply; primary; 117 volts; 50-60 cycles; secondary; 8.5 volts at 1 ampere each side of center tap; secondary; 6.3 volts at 4.5 ampere
T 4	25B813404	Power: plate; primary; 117 volt; 50-60 cycles; secondary; 200 volts at 55 ma.
		TUBES,
V 1	5R4GY	Electron
V 2		Same as V 1
		SOCKETS,
X 1	9B6763	Tube: female; 8 contact; molded black bakelite base; saddle mounting
X 2		Same as X 1

Motorola®

THE "RESEARCH" LINE

AC POWER SUPPLY CHASSIS

117 VAC OPERATION



P-8531
POWER SUPPLY

MODELS	APPLICATION
P-8531	Receiver Only Models
P-8531-A	Power for #2 Receiver in 2 Receiver Base Station Models
P-8531-AR	Special Applications
P-8531-R	Special Applications

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

Printed in U.S.A.
10/54-CP

54P880326
Issue - K

DESCRIPTION

The P-8531 AC operated Power Supply described in this section is designed to provide all of the voltages required for the operation of a MOTOROLA fixed frequency communications receiver, SENSICON or equivalent. Selenium rectifiers connected for full wave rectification provide the receiver B+ voltage. Two replaceable, cartridge type fuses provide adequate overload protection of the power circuits.

The P-8531-A Power Supply is a modified version of the basic unit. This chassis is designed to provide the power and control facilities required by the #2 receiver in a two receiver remotely controlled "BR" or locally controlled "BY" base station installation. A relay is included to furnish the receiver B+ muting function.

The P-8531-R Power Supply is another modified version of the basic unit. This chassis is designed to provide the AC and DC voltages required for operation of a control receiver or repeater balanced control circuits. The B+ circuit is isolated from ground and an adjustable resistor provided to allow DC output voltage settings of 0 to 175 volts.

The P-8531-AR Power Supply is a modification of the P-8531-A Power Supply which has the receiver B+ muting function eliminated to keep the #2 receiver operating at all times.

NOMINAL PERFORMANCE SPECIFICATIONS

BASIC UNIT	P-8531 and P-8531-A P-8531-AR	P-8531-R
PRIMARY POWER SOURCE	117 volts, 60 cycle, single phase, 2-wire	
OUTPUT RATING	180 VDC at 55 ma. 6.3 VAC at 3.5 amps.	180 VDC at 55 ma. or 0-175 VDC at 50 ma. max. 6.3 VAC at 3.5 amps.
DIMENSIONS	19" long x 2-1/8" wide x 5-1/4" high	
WEIGHT	Approximately 6 lbs.	
MOUNTING	Standard 19" Rack	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

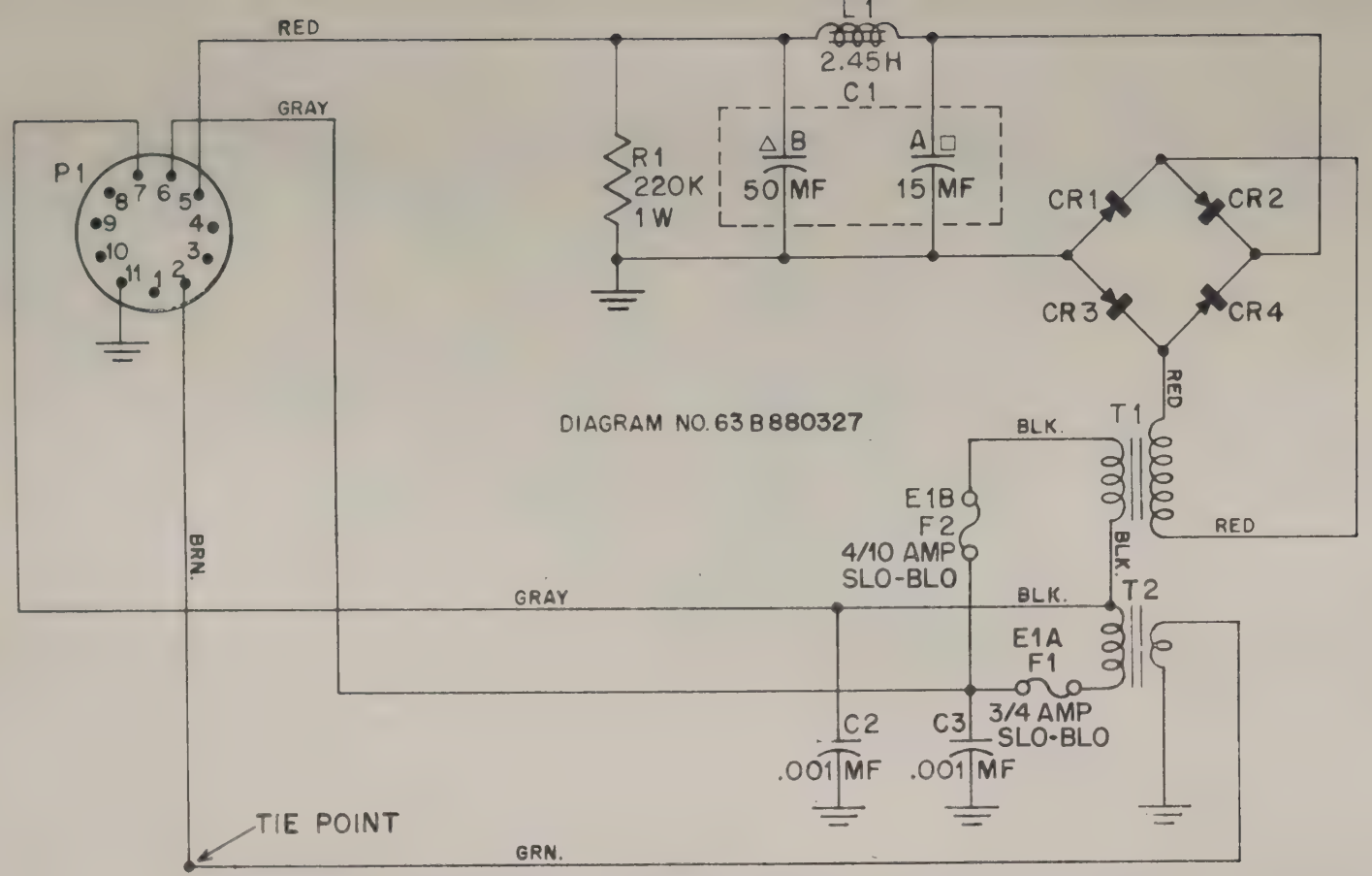


DIAGRAM NO. 63B880327

THIS DIAGRAM IS APPLICABLE *AS DRAWN* TO THE LATEST PRODUCTION VERSION INDICATED BY SUFFIX NUMBERS IN THE TABLE. IT IS APPLICABLE TO EACH EARLIER PRODUCTION VERSION WHEN AMENDED BY *ALL* SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS.

CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS: DISCONTINUED VERSIONS								LATEST VERSION
	160	174	394	416				538	
P-8531	-1	-2	-3	-4					-5

MOTOROLA
PART NO. 63B880327
ISSUE - L 10/54-CP

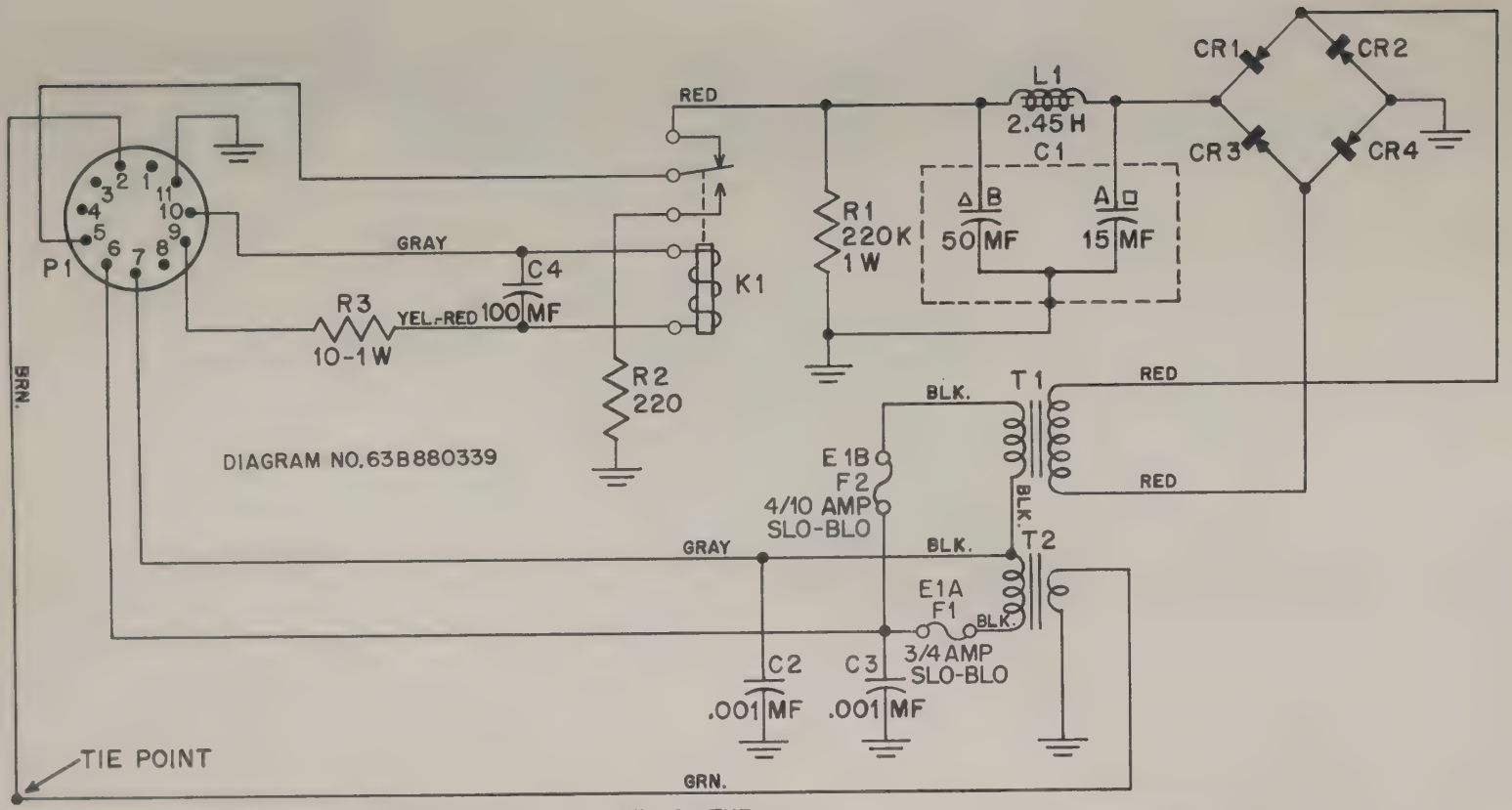
P-8531 AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

P-8531 AC POWER SUPPLY

Reference:
Schematic Diagram
63B880327

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	23K890493	Fixed: electrolytic; two sections
C 1A		□15 mf +50-10%; 350 vdcw
C 1B		Δ50 mf +50-10%; 300 vdcw
C 2	21R6663	Fixed: mica; 1000 mmf ±10%; 500 vdcw
C 3		Same as C 2
		RECTIFIERS,
CR 1	48B478111	Metallic: selenium; 6 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
		HOLDER,
E 1	31A480477	Fuse: dual fuse mounting; for 1-1/4" long x 1/4" diameter fuses
		FUSES,
F 1	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 2	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
		COIL, AF:
L 1	25K87302	Filter; 2.45 henries
		CONNECTOR,
P 1	28B813576	Receptacle: male; 11 contact; does not include 42A821428 RING, connector retainer; which must be ordered separately
		RESISTOR,
R 1	6R5574	Fixed: carbon; 220K ±10%; 1 w; ins.
		TRANSFORMERS,
T 1	25B813404	Power: plate; primary; 117 volt; 50-60 cps.; secondary, 190 volts at 55 ma.
T 2	25B880299	Power: filament; primary; 117 volt; 60 cps.; secondary 6.3 volt at 4 ampere



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CHASSIS	MODIFYING SERVICE BULLETIN NUMBERS: DISCONTINUED VERSIONS								LATEST VERSION
	160	174	394	416				538	
P-8531-A	-1	-2	-3	-4					-5

MOTOROLA
PART NO. 63B880339
ISSUE - L 10/54-CP

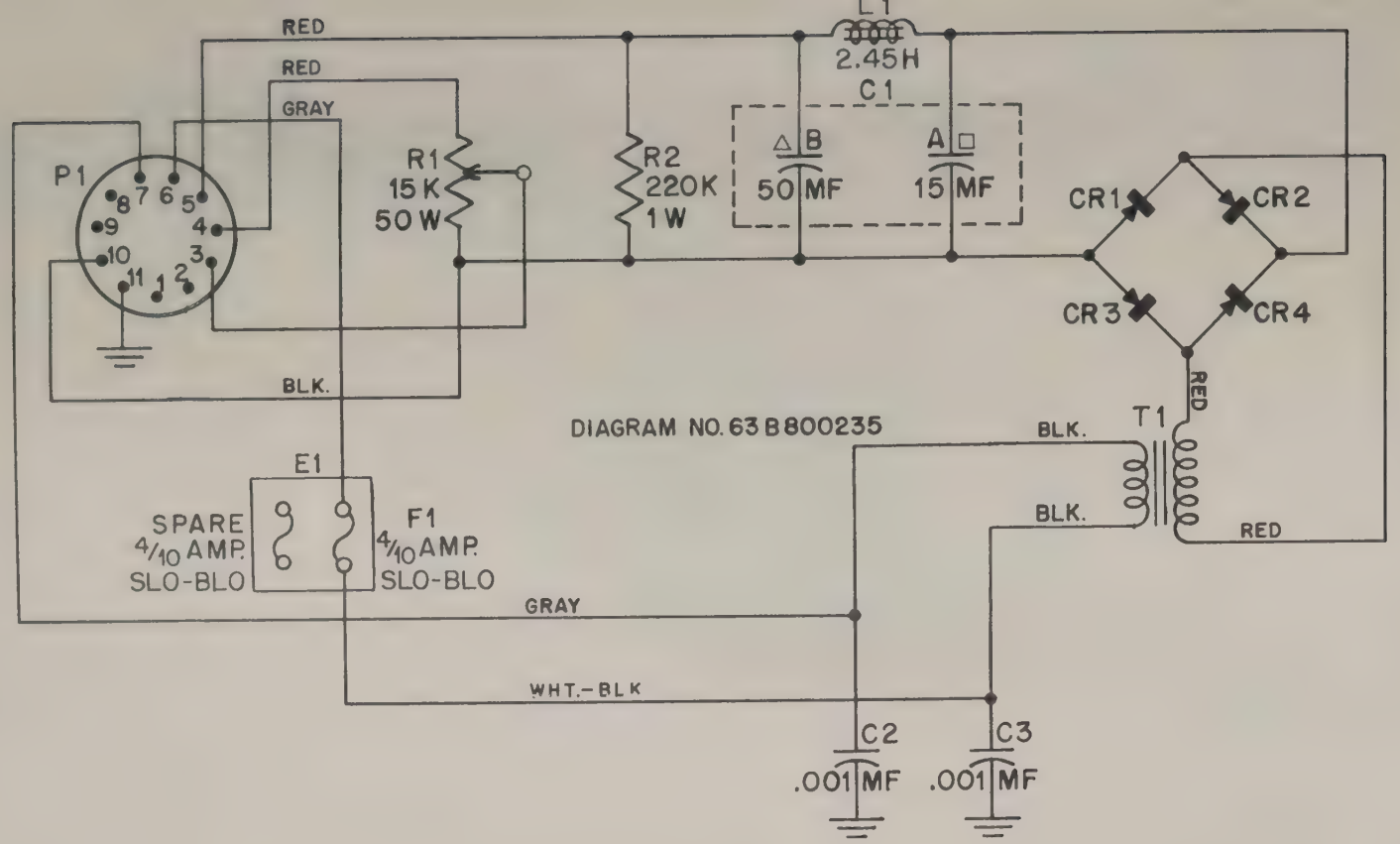
P-8531-A AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

P-8531-A AC POWER SUPPLY

Reference:
Schematic Diagram
63B880339

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	23K890493	Fixed: electrolytic; two sections
C 1A		□15 mf +50-10%; 350 vdcw
C 1B		△50 mf +50-10%; 300 vdcw
C 2	21R6663	Fixed: mica; 1000 mmf ±10%; 500 vdcw
C 3		Same as C 2
C 4	23B892549	Fixed: electrolytic; 100 mmf +100-15%; 25 vdcw
		RECTIFIERS,
CR 1	48B478111	Metallic: selenium; 6 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
		HOLDER,
E 1	31A480477	Fuse, dual fuse mounting; for 1-1/4" long x 1/4" diameter fuses
		FUSES,
F 1	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 2	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
		RELAY,
K 1	59B800031	Armature: contact arrangement, 1 form "C"
	or 1V832767	Armature: assembly; includes: 80B825612 RELAY, armature; contact arrangement; 1 form "C" 7A825613 BRACKET, relay mtg.
		COIL, AF:
L 1	25K87302	Filter; 2.45 henries
		CONNECTOR,
P 1	28B813576	Receptacle: male; 11 contact does not include 42A821428 RING, connector retainer; which must be ordered separately
		RESISTORS,
R 1	6R5574	Fixed: carbon; 220K ±10%; 1 w; ins.
R 2	6R6270	Fixed: carbon; 220 ±10%; 1/2 w; ins.
R 3	6R488022	Fixed: 10 ohm ±10%; 1 w; ins.
		TRANSFORMERS,
T 1	25B813404	Power: plate; primary; 117 volt; 50-60 cps.; secondary; 190 volts at 55 ma.
T 2	25B880299	Power: filament; primary; 117 volt; 60 cps.; secondary 6.3 volt at 4 ampere



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CHASSIS	DISCONTINUED VERSIONS								LATEST VERSION
P-8531-R	-1	-2	-3	-4	-5				-6

MODIFYING SERVICE BULLETIN NUMBERS: 160, 174, 394, 416, 477, 538

MOTOROLA
PART NO. 63B800235
ISSUE - L 10/54-CP

P-8531-R AC POWER SUPPLY CHASSIS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

P-8531-R AC POWER SUPPLY

Reference:
Schematic Diagram
63B800235

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	23K890493	Fixed: electrolytic; two sections
C 1A		□15 mf +50-10%; 350 vdcw
C 1B		△50 mf +50-10%; 300 vdcw
C 2	21R6663	Fixed: mica; 1000 mmf ±10%; 500 vdcw
C 3		Same as C 2
		RECTIFIERS,
CR 1	48B478111	Metallic: selenium; 6 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
		HOLDER,
E 1	31A480477	Fuse: dual fuse mounting; for 1-1/4" long x 1/4" diameter fuses
		FUSE,
F 1	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter;
		COIL, AF:
L 1	25K87302	Filter; 2.45 henries
		CONNECTOR,
P 1	28B813576	Receptacle: male; 11 contact; does does not include 42A821428 RING, connector retainer; which must be ordered separately
		RESISTORS,
R 1	17B51774	Adjustable: wire-wound; 15K ±10% 50 w; ins.
R 2	6R5574	Fixed: carbon; 220K ±10%; 1 w; ins.
		TRANSFORMER,
T 1	25B813404	Power: plate; primary; 117 volt; 50-60 cps.; secondary, 190 volts at 55 ma.

| MODIFYING SERVICE BULLETIN NUMBERS | | |

SCHEMATIC DIAGRAM PARTS LIST

P-8531-AR AC POWER SUPPLY

Reference:
Schematic Diagram
63B804292

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	23K890493	Fixed: electrolytic; two sections
C 1A		□15 mf +50-10%; 350 vdcw
C 1B		△50 mf +50-10%; 300 vdcw
C 2	21R6663	Fixed: mica; 1000 mmf ±10%; 500 vdcw
C 3		Same as C 2
C 4	23B892549	Fixed: electrolytic; 100 mmf +100-15%; 25 vdcw
		RECTIFIERS,
CR 1	48B478111	Metallic: selenium; 6 plate
CR 2		Same as CR 1
CR 3		Same as CR 1
CR 4		Same as CR 1
		HOLDER,
E 1	31A480477	Fuse: dual fuse mounting; for 1-1/4" long x 1/4" diameter fuses
		FUSES,
F 1	65K892099	Cartridge: one time; slo-blo; glass; 3/4 ampere; 125 volt; 1-1/4" long x 1/4" diameter
F 2	65K834465	Cartridge: one time; slo-blo; glass; 4/10 ampere; 125 volt; 1-1/4" long x 1/4" diameter
		RELAY,
K 1	59B800031	Armature: contact arrangement, 1 form "C"
	or 1V832767	Armature: assembly; includes: 80B825612 RELAY, armature: contact arrangement, 1 form "C" 7A825613 BRACKET, relay mounting
		COIL, AF:
L 1	25K87302	Filter; 2.45 henries
		CONNECTOR,
P 1	28B813576	Receptacle: male; 11 contact; does not include 42A821428 RING, connector retainer; which must be ordered separately
		RESISTORS,
R 1	6R5574	Fixed: carbon; 220K ±10%; 1 w; ins.
R 2	6R6270	Fixed: carbon; 220 ±10%; 1/2 w; ins.
		TRANSFORMERS,
T 1	25B813404	Power: plate; primary; 117 volt; 50-60 cps.; secondary, 190 volts at 55 ma.
T 2	25B880299	Power: filament; primary; 117 volt; 60 cps.; secondary 6.3 volt at 4 ampere

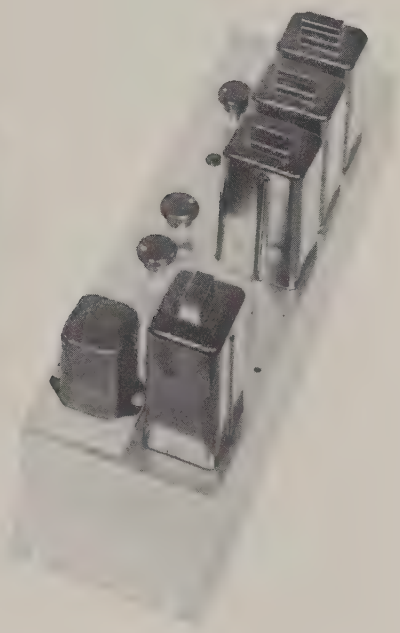
Motorola®

THE "RESEARCH" LINE

REMOTE CONTROL CHASSIS

BASE STATION INSTALLATION

P-8066-N and P-8066-NR



P-8066-P

MODEL	APPLICATION
P-8066-N	One single-frequency transmitter and one single-frequency receiver.
P-8066-NR	One single-frequency transmitter and one single-frequency receiver for Repeater (RT) applications.
P-8066-P	One single-frequency transmitter with two single-frequency receivers; or one two-frequency transmitter with one or two single-frequency receivers.

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

Printed in U.S.A.
10/54-CP

54P810720
Issue - E

1. DESCRIPTION

The P-8066-N and P-8066-P Remote Control Chassis are designed for application in single and two-frequency remotely controlled base station models respectively. All standard remote control functions for the stations are administered by these chassis. The remote control chassis serves as the terminal facility for the 500/600 ohm 2 or 4 wire control line from the associated remote control console. DC control voltages as received via the control line from the remote console are translated by the remote control chassis into specific operating functions for the base station. The necessary receiver squelch control(s), control relay(s) and line input transformer for the transmitter and receiver are incorporated on this chassis.

The P-8066-NR Remote Control Chassis is designed for standard single-frequency Repeater (RT) - "Talk-back" Repeater- applications. The chassis is identical to the P-8066-N except for the addition of a series capacitor-resistor network connected across the transmitter control circuit. This network is incorporated to reduce voltage surges across the contacts of the receiver squelch relay which is employed for repeater (RT) operation. In standard repeater (RT) applications, the P-8066-NR functions as the intermediary between the station receiver and transmitter. Receiver audio output is fed through audio coupling circuits on the remote control chassis to the input of the transmitter. As the squelch relay is actuated by a received carrier signal, the transmitter becomes energized and the received audio is retransmitted.

The P-8066-NR may be used in place of the P-8066-N for standard single-frequency base station applications without internal wiring modifications. Note however, that the P-8066-N should not be employed in Repeater (RT) stations unless the protective capacitor-resistor network is added.

2. APPLICATION

a. P-8066-N Remote Control Chassis

(1) Description

The P-8066-N Remote Control Chassis is used in all remotely controlled base station models employing one single-frequency transmitter and receiver. The chassis includes the receiver SQUELCH control (R 3), transmit-receive relay (K 1), and LINE INPUT control (R 1).

The SQUELCH control is used for use in squelching the receiver at the remote control chassis. The LINE INPUT control is for adjusting the audio input level from the remote control unit to the transmitter modulator. The transmit-receive relay is actuated by a 8 ma. direct current from the remote control console. The functions of the transmit-receive relay (K 1) are as follows:

(a) Connects the audio input from the remote control console to the transmitter modulator input when the remote control console is in the transmit condition.

(b) Connects the receiver audio output to the control line in the receive condition.

(c) Controls the transmit-receive relay on the power supply chassis.

(2) Operation

Operation of this remote control chassis is dependent upon application of a control voltage from an external source such as a remote control console. Operation with a MOTOROLA PA-8270 Series Remote Control Consolette is as follows:

(a) To transmit:

To transmit (using a single-frequency transmitter); place the frequency selector switch on the remote control console front panel in FREQ. 2 position and depress the push-to-talk switch on the microphone or foot switch. When the push-to-talk switch on the microphone is depressed a DC voltage from the console power supply is impressed across the line to produce an approximate +8 ma. current flow through the control line. This current energizes the "transmit-receive" relay (K 1) on the transmitter remote control chassis. Actuation of this relay keys the transmitter and simultaneous switches "off" receiver B+ rendering the receive inoperative.

(b) To receive:

Release push-to-talk switch. Receiver B+ is restored and audio output may be heard at the remote control console. Receiver audio is fed to the control line via the 3 ohm primary winding of line transformer T 1 on the remote control chassis.

Operation with a MOTOROLA FSC Research Line Remote Control Console is the

same as with a PA-8270 Series Consolette except that the position of the FREQ. 1--FREQ. 2 switch is immaterial.

b. P-8066-P Remote Control Chassis

(1) Description

The P-8066-P Remote Control Chassis is used in all remotely controlled upright cabinet (BR) base station models employing a single-frequency transmitter and two receivers, or a two-frequency transmitter and one or two receivers. This chassis includes SQUELCH controls for two receivers, a LINE INPUT control for adjustment of the audio input to the transmitter modulator and four relays to perform the necessary control functions.

The SQUELCH Controls, one for each receiver, are for use in squelching the receiver(s) at the remote control chassis. The LINE INPUT control is for adjusting the audio input level from the remote control unit to the transmitter modulator. Relays K 1, K 2 and K 3 perform transmitter frequency selection and receiver muting functions for the base station units (see operation). Relay K 3 also switches 117 VAC to the coil of the transmit-receive relay K 4 governing operation of that relay. The functions of the transmit-receive relay (K 4) are as follows:

(a) Connects the audio input from the remote control console to the modulator input when the remote control console is in the transmit condition.

(b) Connects the receiver audio output to the control line in the receive condition.

(c) Controls the transmit-receive relay on the power supply chassis.

(2) Operation

Operation of this remote control chassis is dependent upon the magnitude and polarity of the control voltage applied from a remote control console. Operation with either an FSC Remote Control Console or a PA-8270 Series Consolette is the same except as noted otherwise in the following paragraphs.

NOTE

For proper operation the control line must be connected such that terminal 8 is positive with respect to terminal 7 when the push-to-talk circuit is completed from the console.

(a) To transmit on frequency #1:

Place frequency selector switch on the remote control console front panel in FREQ. 1 position. Depress the push-to-talk switch at the remote control console. A voltage from the console power supply will be impressed on the control line producing a positive 4 ma. direct current to actuate a polarized relay K 3. Closing of the contacts of the K 3 relay also switches 117 VAC to the coil of K 4. The K 4 relay turns "on" the transmitter and simultaneously switches "off" receiver B+ muting both receivers. The positive 4 ma. will continue to flow and the carrier will remain "on the air" as long as the push-to-talk switch is depressed. Relay K 2 (10 ma.), while de-energized, grounds the cathode circuit of the #1 oscillator deck permitting the transmitter to operate on the #1 channel.

(b) To transmit on frequency #2:

Place the frequency selector switch in FREQ. 2 position and depress the push-to-talk switch. A voltage from the console power supply will be impressed on the control line to produce a positive 10 ma. direct current flow through the control line to actuate relays K 2 and K 3 on the remote control chassis. Actuation of relay K 2 grounds the cathode circuit of the #2 oscillator deck permitting the transmitter to operate on the #2 channel. Closing of the contacts of the K 3 relay also switches 117 VAC to the coil of the K 4 relay. Actuation of the K 4 relay turns "on" the transmitter and also simultaneously switches "off" receiver B+ muting both receivers. The +10 ma. will continue to flow and the carrier will remain "on the air" as long as the push-to-talk switch is depressed.

(c) To mute #2 receiver:

When using an FSC series Deluxe Remote Control Console, place the RCVR. ON-OFF switch momentarily in the OFF position— when using a PA-8270 series Remote Control Consolette prior to "H" models, press the MUTE RCVR. 2 button and momentarily push the tone key up — when using a PA-8270 J or H model console, momentarily depress the MUTE RCVR. 2 push-button only — when using a "RESEARCH" Line FSC series Remote Control Console, actuate the MUTE RCVR. 2 switch. A voltage will be impressed on the line from the console power supply to produce a momentary -4 ma. direct current flow through the line to actuate and apply a hold-in voltage to polarized relay (K 1) on the remote control chassis. This action disconnects B+ from the #2 receiver.

(d) To unmute #2 receiver:

When using an FSC Deluxe Remote Control Console, place the RCVR. ON-OFF switch in the ON position — when using a PA-8270 series or the "RESEARCH" Line FSC series Remote Control Console, place the frequency selector switch in FREQ. 2 position and momentarily depress the push-to-talk switch. A voltage will be impressed on the line from the console power supply to produce a +10 ma. direct current flow through the line to actuate relay (K 2) which in turn breaks the hold-in voltage and unlocks relay (K 1), thereby unmuting receiver #2.

(e) To receive:

On single receiver models, the output of the receiver may be heard whenever the transmitter circuits are not actuated. On two receiver models, both receivers are heard simultaneously whenever the #2 receiver is unmuted and the transmitter is not actuated. Provisions to mute the #1 receiver are purposely omitted, to assure that signals from primary frequency stations are always heard. Receiver audios are fed to the control line via the 3 ohm primary winding of line transformer T 1 on the remote control chassis.

c. P-8066-NR Remote Control Chassis

(1) Description

The P-8066-NR Remote Control Chassis is used in all standard Repeater (RT) stations employing a single-frequency transmitter and receiver. The chassis includes the receiver SQUELCH control (R 3), a LINE INPUT control (R 1), a transmit-receive relay (K 1) and a squelch relay spark suppressor circuit (R 6 - C 4).

The SQUELCH control is used to squelch the receiver at the remote control chassis. The LINE INPUT control is used to adjust the audio level from the receiver to the transmitter modulator. Resistor-capacitor network, R 6 - C 4, is incorporated to prevent voltage surges across the contacts of the receiver squelch relay. The transmit-receive relay K 1, which is included on this chassis is not operated in standard repeater (RT) applications.

The P-8066-NR Remote Control Chassis may also be used in applications where both automatic repeater (RT) and remote control console operation is required of the same station; i.e., a "mobile relay" station operated alternately as a base station. In this operation, relay K 1 will be controlled by the remote console in the identical manner as for standard base station applications employing a P-8066-N Remote Control Chassis. The functions of K 1 will exactly parallel those described for the P-8066-N. It is to be noted, however, that repeater (RT) operation will only be possible when relay K 1 is de-energized, thus granting transmission priority to the remote console at all times.

(2) Operation

(a) Repeater (RT) Operation

For standard repeater (RT) applications, the P-8066-NR functions primarily as an audio coupling unit between the receiver and transmitter. When a signal is received, the audio from the receiver is routed thru the line transformer (T 1) and level control (R 1) of the remote control chassis to the transmitter modulator input. Simultaneously, the squelch relay, associated with the receiver, completes the push-to-talk circuit of the transmitter and the received signal is retransmitted.

(b) Mobile Relay/Base Station Operation

When a standard repeater (RT) station is used in conjunction with a remote control console - as may be desired for specific mobile relay systems - the P-8066-NR remote control chassis will perform standard repeater (RT) functions whenever the transmitter "push-to-talk" circuit is not actuated by the remote console (see paragraph (2)(a) preceeding). When the remote console operator wishes to operate the repeater as a base station, he does so by actuating the "push-to-talk" circuit of the transmitter in the conventional manner as described for standard single-frequency base stations. This actuates relay K 1 on the remote control chassis which disconnects the receiver output from the transmitter input circuit. Simultaneously, the audio input from the remote control console is connected to the transmitter input circuit. In this manner signals broadcast from the console modulate the outgoing RF carrier. Signals received by the receiver during this period do not effect transmitter operation in any way. Thus, the remote console is granted priority of transmission over all mobile relay communications. It is to be noted also that the receiver is not muted during transmission as is the case for standard base station operation. Hence, received audio may be heard at the console at all times.

3. SYSTEM ADJUSTMENTS

a. Volume and Squelch Adjustments for P-8066-N (Single-Frequency Transmitter-One Receiver Base Station Models)

(1) Squelch Adjustment

Place the SPEAKER switch on the meter switching panel in the SPEAKER ON position. With no signal received, turn the SQUELCH control on the remote control chassis from the full counterclockwise position (open squelch), slowly, in the clockwise direction until the speaker is just quiet (noise squelched). Do not advance the control beyond the point of just squelching the noise. Further clockwise rotation of the control will increase the minimum signal necessary to open the squelch circuit.

(2) Volume Adjustment (on receiver)

Connect a db. meter or a line level meter across terminals 7 and 8 in the bottom row of terminals of the terminal board on the rear of the remote control chassis. Adjust the VOLUME control on the receiver to obtain zero db. or a reading of 1.73 volts peak with normal signal being received. (CAUTION: Do not use unsquelched receiver noise.)

b. Volume and Squelch Adjustments for P-8066-P (One or Two-Frequency Transmitter-Two Receiver Base Station Models)

(1) Squelch Adjustment

Make the adjustment for #1 receiver as outlined above for the single receiver model with the VOLUME control of the #2 receiver in the maximum counterclockwise (off) position. Similarly, adjust the #2 receiver squelch with the #1 receiver VOLUME control in the maximum counterclockwise (off) position.

(2) Volume Adjustment (on receiver)

Make the adjustment for the #1 receiver as outlined in the above paragraph for single receiver upright cabinet (BR) models with the VOLUME control of the #2 receiver turned completely counterclockwise (off).

Mark the setting of the VOLUME control of the adjusted receiver and return it to full counterclockwise (off) position. Similarly, adjust the VOLUME controls of the #2 receiver.

Reset VOLUME control of the #1 receiver to the pre-determined position.

c. Volume and Squelch Adjustment for P-8066-NR (Repeater (RT) Station Models)

(1) Squelch Adjustment

Adjust the SQUELCH control in the same manner as described for the P-8066-N.

(2) Volume Adjustment (on receiver)

Connect a db. meter or a line level meter across terminals 7 and 8, bottom row of the terminal board on the rear of the remote control chassis.

(a) When remote console is not used:

Adjust the VOLUME control on the receiver to obtain zero db. or a reading of 1.73 volts with a normal signal being received. (CAUTION: Do not use squelch noise.)

(b) When a remote console is used:

With a normal signal being received, adjust the VOLUME control on the receiver to the same level reading on the meter as obtained when transmitting an audio signal from the remote console. NOTE: Console output level should be previously adjusted for zero db. as read on the console's meter while transmitting. Due to line losses this level may be somewhat less than zero db. at the station end of the line where the VOLUME adjustment reading is measured.

d. Line Input Control Adjustment for P-8066-N and P-8066-P

The LINE INPUT control on the remote control chassis establishes the audio input level from the remote control console to the transmitter.

Two suggested methods of adjustment in the order of preference are listed following. Be sure Remote Console level adjustments are made befor proceeding with LINE INPUT adjustments.

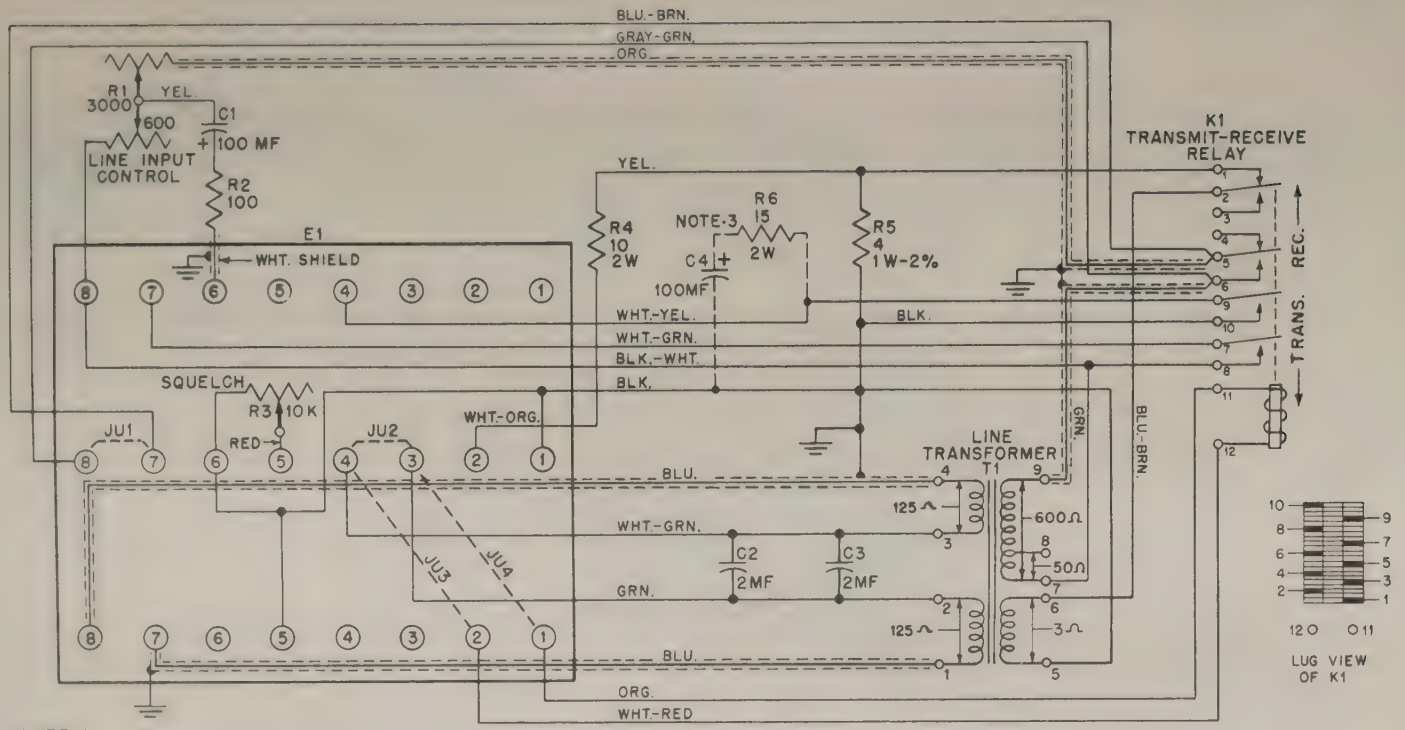
(1) The LINE INPUT control may be set by means of a high impedance VTVM (Hewlett Packard Model 400A voltmeter or equivalent) connected across terminals 6 and 8 top row on the remote control chassis (grounded side of the meter connected to terminal 8). With a 1000 cycle tone or the Alert Tone signal from the console fed into

the control line at zero level at the remote control point, the LINE INPUT control should be set to give a 0.18 volt reading.

(2) Park a mobile unit approximately one mile from the station to be adjusted and connect an audio output meter across the 3 ohm speaker terminals of that equipment. If an output meter is not available, a MOTOROLA P-8501-A Test Set connected to the METER receptacle of the receiver may be used for this purpose. Station one operator at the mobile station, another operator at the base station and a third operator at the remote control console. Have the console operator alternately transmit the 1000 cycle test tone or the alert tone signal from the console at 5 second "on" and "off" intervals. These tones should be transmitted at a zero db. level as indicated on the console meter. Have the base station operator increase the LINE LEVEL control in sequential steps, starting from the extreme counterclockwise position, for each interval that the signal is being transmitted. During the "off" signal period, have the mobile operator call back to the station and read out the maximum meter reading for that interval plus the reading attained at the end of the previous "on" period. Repeat this procedure until the reading at the mobile station reaches its maximum and just begins to decline with further increase in LINE LEVEL adjustment.

e. Line Input Control Adjustment for P-8066-NR

The LINE INPUT control on this remote control chassis establishes the audio input level from the receiver to the transmitter. This control may be set by means of a high impedance VTVM (Hewlett Packard Model 400A voltmeter or equivalent) connected across terminals 6 and 8 top row on the remote control chassis (grounded side of the meter connected to terminal 8). With a normal signal being received by the receiver, adjust the LINE LEVEL control for a reading of 0.18 on the meter.



NOTES:

1. ALL RESISTOR VALUES ARE IN OHMS ±10 % AND ARE ½ WATT UNLESS OTHERWISE SPECIFIED.
2. K-1 IS SHOWN IN RECEIVE POSITION.
3. R6,C4,& ASSOCIATED DOTTED LEADS USED ON P-8066-NR ONLY.

THIS DIAGRAM IS APPLICABLE *AS DRAWN* TO THE LATEST PRODUCTION VERSION INDICATED BY SUFFIX NUMBERS IN THE TABLE. IT IS APPLICABLE TO EACH EARLIER PRODUCTION VERSION WHEN AMENDED BY *ALL* SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS.

MODEL	DISCONTINUED VERSIONS	MODIFYING SERVICE BULLETIN NUMBERS: 541	LATEST VERSION
P-8066-N			-1
P-8066-NR			-1

P-8066-N JUMPER TABLE

APPLICATION	JU-1	JU-2	JU-3	JU-4
2 WIRE REMOTE CONTROL	OMIT	OMIT	USED	USED
BASE STATION (RA)	OMIT	USED	OMIT	OMIT
4 WIRE REMOTE CONTROL	OMIT	USED	OMIT	OMIT
REPEATER (RA)	OMIT	USED	OMIT	OMIT

P-8066-NR JUMPER TABLE

APPLICATION	JU-1	JU-2	JU-3	JU-4
REPEATER (RT)	USED	OMIT	USED	USED

MODEL DESCRIPTION

MODEL	CIRCUITRY	APPLICATION
P-8066-N	AS SHOWN SOLID	BASE, BASE (RA) AND REPEATER (RA)
P-8066-NR	SEE NOTE 3	REPEATER (RT)

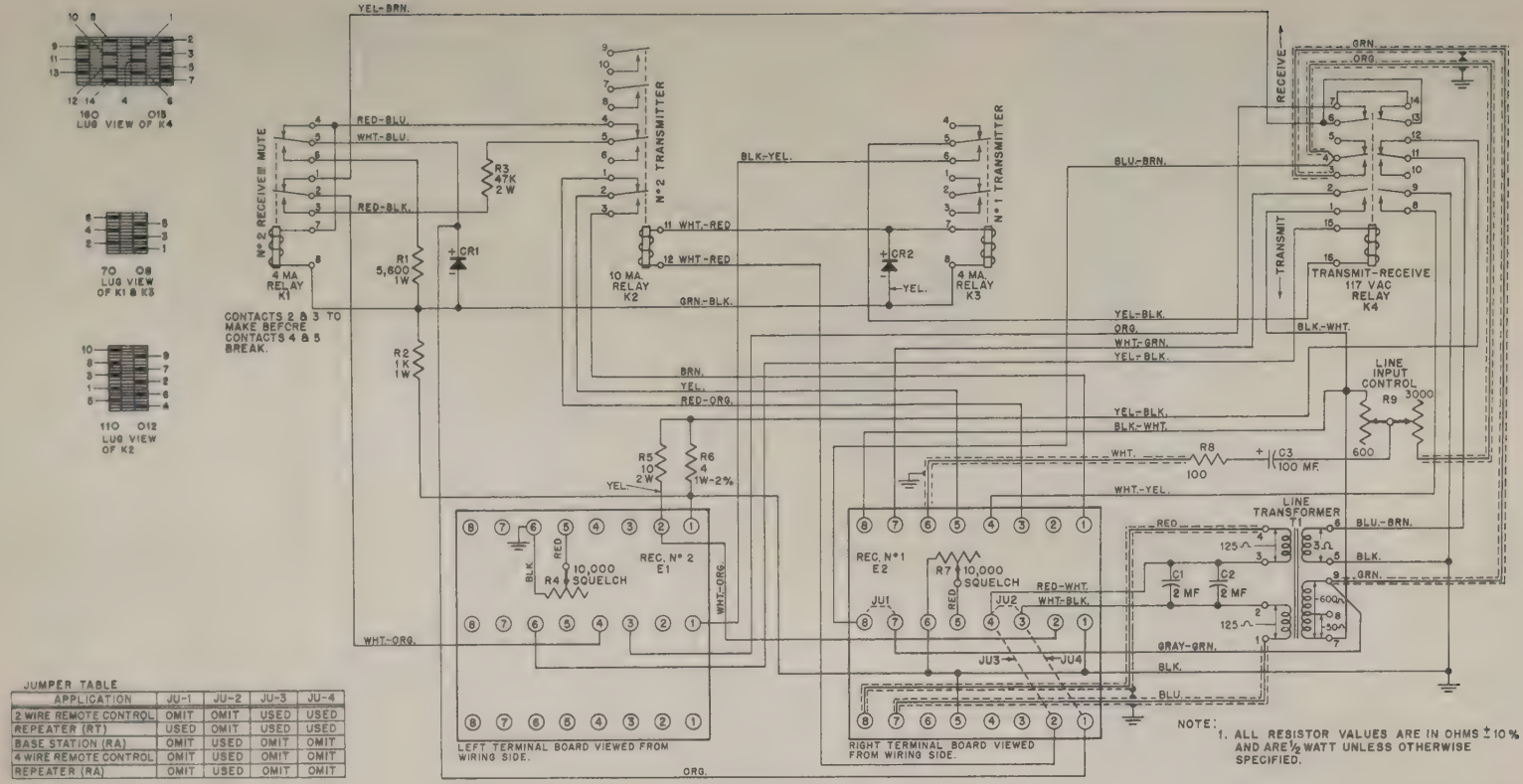
MOTOROLA
PART NO. 63C810721
ISSUE - C 10/54-CP

SCHEMATIC DIAGRAM PARTS LIST

P-8066-N and P-8066-NR Remote Control Chassis

Reference:
Schematic Diagram
63C810721

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	23B892549	Fixed: electrolytic; tubular; 100 mf +100-15%; 25 vdcw
C 2	8A81769	Fixed: paper; rectangular; 2 mf; 200 vdcw
C 3		Same as C 2
C 4		Same as C 1 except used only on P-8066-NR
		BOARD,
E 1	31B81754	Terminal: 24 screw terminals
		RELAY,
K 1	59B81303	Armature: contact arrangement, 2 form "C", 2 form "A"
		ATTENUATOR,
R 1	18A811698	Variable "L" pad; wire-wound; 600 to 3000 ohm; 4 w;
		RESISTORS,
R 2	6R6326	Fixed: carbon; 100 ohm ±10%; 1/2 w; ins.
R 3	18K898247	Variable: wire-wound; 10, 000 ohm 4 w.
R 4	6R488033	Fixed: carbon; 10 ohm ±10%; 2 w; ins.
R 5	17K892469	Fixed: wire-wound; 4 ohm ±2%; 1 w; ins.
	or 17B821901	Fixed: wire-wound; 4 ohm ±2%; 3 w; ins.
R 6	6R476059	Fixed: carbon; 15 ohm ±10%; 2 w; ins.; used only on P-8066-NR
		TRANSFORMER, AF:
T 1	25B811697	Line type: primary, two 125 ohm windings to match 500 ohm line secondary #1, 600 ohm tapped at 50 ohm secondary #2, 3 ohm



JUMPER TABLE

APPLICATION	JU-1	JU-2	JU-3	JU-4
2 WIRE REMOTE CONTROL	OMIT	OMIT	USED	USED
REPEATER (RT)	USED	OMIT	USED	USED
BASE STATION (RA)	OMIT	USED	OMIT	OMIT
4 WIRE REMOTE CONTROL	OMIT	USED	OMIT	OMIT
REPEATER (RA)	OMIT	USED	OMIT	OMIT

NOTE:
1. ALL RESISTOR VALUES ARE IN OHMS ±10% AND ARE ½ WATT UNLESS OTHERWISE SPECIFIED.

THIS DIAGRAM IS APPLICABLE *AS DRAWN* TO THE LATEST PRODUCTION VERSION INDICATED BY SUFFIX NUMBERS IN THE TABLE. IT IS APPLICABLE TO EACH EARLIER PRODUCTION VERSION WHEN AMENDED BY *ALL* SERVICE BULLETINS LISTED FOR SUCCEEDING VERSIONS.

MODEL	MODIFYING SERVICE BULLETIN NUMBERS: DISCONTINUED VERSIONS	LATEST VERSION
	541	
P-8066-P		-1

MOTOROLA
PART NO. 63C810722
ISSUE - C 10/54-CP

P-8066-P REMOTE CONTROL CHASSIS SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

P-8066-P Remote Control Chassis

Reference:
Schematic Diagram
63D810722

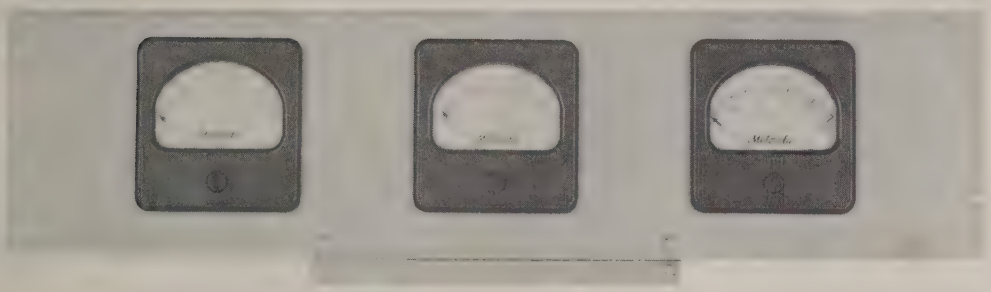
REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CAPACITORS,
C 1	8A81769	Fixed: paper; rectangular; 2 mf; 200 vdcw
C 2		Same as C 1
C 3	23B892549	Fixed: electrolytic; tubular; 100 mf +100-15%; 25 vdcw
		RECTIFIERS,
CR 1	48B90140	Metallic: selenium; 6 plate
CR 2		Same as CR 1
		BOARDS,
E 1	31B81754	Terminal: 24 screw terminals
E 2		Same as E 1
		RELAYS,
K 1	59K801503	Armature: contact arrangement; 2 form "C"
K 2	59A82985	Armature: contact arrangement; 2 form "A"; 2 form "C"
K 3		Same as K 1
K 4	59A86269	Armature: dual stack; contact arrangement; 1st stack, 1 form "B", 1 form "C" and 1 form "A"; 2nd stack 1 form "B", 1 form "C" and 1 form "A"
		RESISTORS,
R 1	6R5654	Fixed: carbon; 5600 ohm ±10%; 1 w; ins.
R 2	6R6327	Fixed: carbon; 1000 ohm ±10%; 1 w; ins.
R 3	6R5736	Fixed: carbon; 47,000 ohm ±10%; 2 w; ins.
R 4	18K898247	Variable: wire-wound; 10,000 ohm 4 w.
R 5	6R488033	Fixed: carbon; 10 ohm ±10%; 2 w; ins.
R 6	17K892469	Fixed: wire-wound; 4 ohm ±2%; 1 w.
	or 17B821901	Fixed: wire-wound; 4 ohm ±2%; 3 w; ins.
R 7		Same as R 4
R 8	6R6326	Fixed: carbon; 100 ohm ±10%; 1/2 w; ins.
		ATTENUATOR,
R 9	18A811698	Variable: "L" pad; wire-wound; 600 to 3000 ohm; 4 w.
		TRANSFORMER, AF:
T 1	25B811697	Line type: primary, two 125 ohm windings to match 500 ohm line; secondary #1, 600 ohm tapped at 50 ohm; secondary #2, 3 ohm

Motorola®

THE "RESEARCH" LINE

BASE STATION METERING FACILITIES

FOR REMOTELY CONTROLLED MODELS



MODEL	DESCRIPTION
P-8449-B	60 Watt "BR" and "BL" Models
P-8449-C	30 Watt "BR" and "BL" Models
K-8494	30 & 60 Watt "BR" and "BL" Models

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

Printed in U.S.A.
10/54-CP

54P812269
Issue - C

1. DESCRIPTION

The "BR" and "BL" base stations incorporate metering facilities which allow easy measurement of all transmitter and receiver circuits essential to tuning and checking. Metering is accomplished with a dual scale 0-50 microampere meter and rotary selector switches with associated cabling. A 0-250 ma. scale is included on the meter face to permit direct reading of the transmitter final amplifier plate current. Also included in the "BR" and "BL" units are two additional meters: a 0-150 VAC meter to measure AC line voltage and a 0-1000 VDC meter to measure the transmitter final amplifier plate voltage.

2. METERING COMPLEMENT

a. K-8494 Meter Panel

The K-8494 Meter Panel consists of a metal mounting plate, a terminal board and three meters:

(1) a 0-150 VAC line voltmeter

(2) a 0-1000 VDC final amplifier plate voltmeter

(3) a dual scale 0-50 microampere, 0-250 ma. milliampere meter.

b. P-8449-B Meter Switching Panel

The P-8449-B Meter Switching Panel is used in conjunction with the 0-50 microampere meter to meter transmitter and receiver circuits. A two pole, 8 position switch, designated RECEIVER is provided to select the receiver circuits to be checked. A second two pole, 8 position switch, designated TRANSMITTER is provided to select the transmitter circuit to be checked. Two sockets are provided on the panel for connecting the meter cable to either the transmitter or receiver switching circuit. Two 11 prong chassis mounted plugs are incorporated to connect the transmitter and receiver metering cable connectors. The metering cables plug into the METERING sockets on the transmitter and receiver chassis. The P-8449-B mounts in the "BR" or "BL" cabinet racks immediately below the power supply in single receiver models and below the power supply for the #2 receiver in two receiver models. The P-8449-B is used for metering all 60 watt "BR" and "BL" models.

c. P-8449-C Meter Switching Panel

The P-8449-C is the same as the P-8449-B Meter Switching Panel except that a shunt resistor, R 3, is added. The P-8449-C Meter Switching Panel is used for metering all 30 watt 152-174 mc. "BR" and "BL" models.

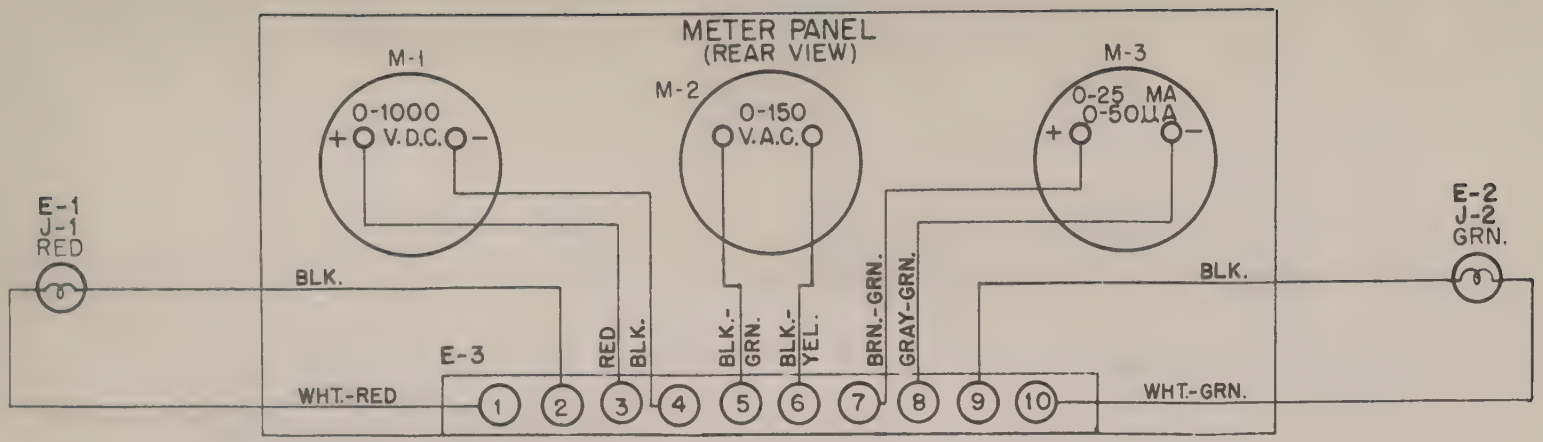
3. OPERATION

a. Single Receiver Models

Refer to the applicable intercabling diagram for the connections to the meter panel. It is necessary to connect 0-50 microampere meter cable to either the transmitter or receiver meter switching circuit by inserting the meter cable plug in either of the two receptacles under their respective selector switches.

b. Two Receiver Models

The two receiver models utilize the same meter switching panel. It is necessary, in the two receiver models, to insert the receiver metering plug in the METER receptacle of the receiver to be metered as there is only one receiver metering cable connected to the meter switching chassis.



MOTOROLA
PART NO. 63B810684
ISSUE - O 10/54-CP

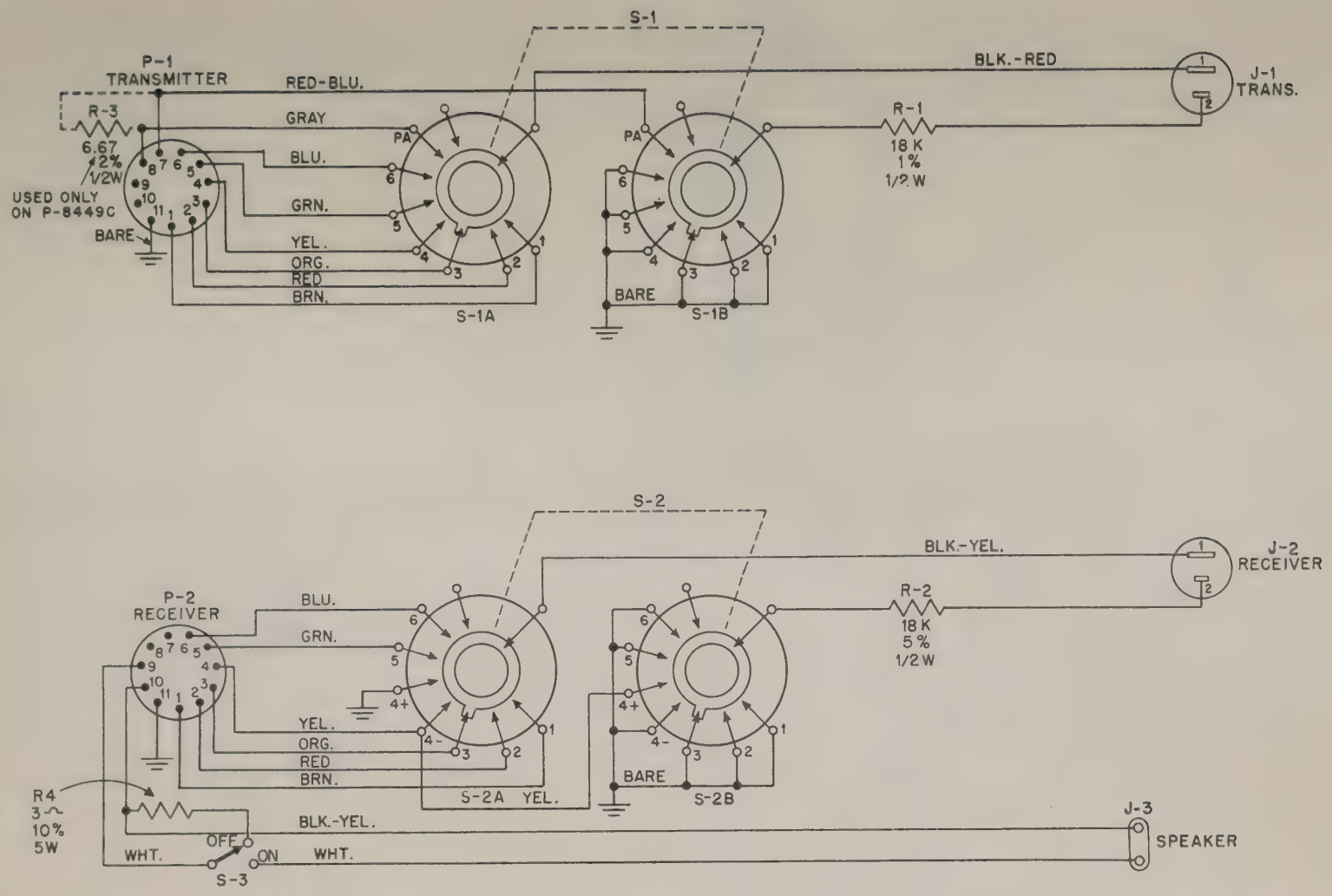
K-8494 METER PANEL
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

K-8494 Meter Panel Kit

Reference:
Schematic Diagram
63B810684

		LAMPS,
E 1	65A891831	Incandescent: 6-8 volts; .73 amp.; 3 candle power; candelabra base; screw type; globe shaped bulb
E 2		Same as E 1
E 3	31A80340	Terminal: 10 screw terminals
		LAMPHOLDERS,
J 1	60A82164	Single contact; candelabra base; screw type; includes insulated mounting bracket
J 2		Same as J 1
		METERS,
M 1	52B891585	0-1000 VDC
M 2	52B891586	0-150 VAC
M 3	52B892096	Multiscale: 0-50 microampere and 0-250 milliampere scale



MOTOROLA
PART NO. 63C812229
ISSUE - A 10/54-CP

P-8449-B & P-8449-C METER SWITCHING PANEL
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

P-8449-B and P-8449-C Meter Switching Panels

Reference:
Schematic Diagram
63C812229

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		CONNECTORS,
J 1	9A891118	Receptacle: female; 2 contact; polarized; round; bakelite base; RECEIVER
J 2		Same as J 1 except TRANSMITTER
J 3	9K82810	Receptacle: female; 2 contact; non-polarized; rectangular; bakelite base; SPEAKER
		CONNECTORS,
P 1	28B813576	Receptacle: male; 11 contact; polarized; round; bakelite base; does not include 42A821428 RING, retainer; which must be ordered separately; TRANSMITTER
P 2		Same as P 1 except RECEIVER
		RESISTORS,
R 1	6A892470	Fixed: carbofilm; 18,000 ohm ±1%; 1/2 w; ins.
R 2	6R488095	Fixed: carbon; 18,000 ohm ±5%; 1/2 w; ins.
R 3	17A892486	Fixed: wire wound; 6.67 ohm ±2%; 1/2 w; ins.; used on P-8449-C only
R 4	17A82839	Fixed: carbon; 3 ohm ±10%; 5 w; ins.
		SWITCHES,
S 1	40B891481	Rotary: 2 pole; 8 position; consisting of:
S 1A		1 pole; 8 position; Rear Section
S 1B		1 pole; 8 position; Front Section
S 2		Same as S 1
S 3	40A80248	Toggle: S.P.D.T.; ON-OFF
	or 40K811753	Toggle: S.P.D.T.; ON-OFF

Motorola®

THE "RESEARCH" LINE

BASE STATION METERING FACILITIES

FOR LOCAL-REMOTE CONTROL MODELS

K-8677 SERIES

K-8689 SERIES

METERING KIT	APPLICATION
K-8677	Single-Receiver "BY" 60 Watt 152-174 mc.
K-8677-A	Single-Receiver "BY" 30 Watt 152-174 mc.
K-8689	Two-Receiver "BY" 60 Watt 152-174 mc.
K-8689-A	Two-Receiver "BY" 30 Watt 152-174 mc.
K-8689-B	Single-Receiver "BYR" 60 Watt 152-174 mc.
K-8689-C	Single-Receiver "BYR" 30 Watt 152-174 mc.

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

Printed in U.S.A.
10/54-CP

54P810685
Issue - C

1. DESCRIPTION

The K-8677 Series and K-8689 Series of Meter Kits are designed for use with the "BY" and "BYR" models. They consist basically of a panel mounted dual scale 0-50 microampere-0-250 milliampere meter, a panel mounted meter selector switch and associated cabling.

2. METERING COMPLEMENT

a. K-8677 Meter Kit

The K-8677 Meter Kit is used for metering all single receiver 60 watt "BY" Base Stations. The switch is a two pole 11 position switch which selects the desired circuit in the transmitter or receiver from the front panel. The switch is marked for positions R_1 through R_6 and T_3 thru T_6 and PA. The R symbol denotes receiver circuits and the T denotes transmitter circuits.

b. K-8677-A Meter Kit

The K-8677-A Meter Kit is used for metering all single receiver 30 watt "BY" Base Stations. It is identical to the K-8677 with the addition of a shunt resistor that is added for operation with 30 watt 152-174 mc. transmitters.

c. K-8689 Meter Kit

The K-8689 Meter Kit is used to meter all circuits essential to tuning and checking on the 60 watt two receiver "BY" models. Electrically the K-8689 Meter Kit is the same as the K-8677. Included with the kit is a metering extension cable that is used with the #2 receiver.

d. K-8689-A Meter Kit

The K-8689-A Meter Kit is used to meter all 30 watt two-receiver "BY" models. It differs from the K-8689 in that a shunt resistor has been added to the kit for 30 watt metering. A metering extension cable is included for metering the #2 receiver.

e. K-8689-B Meter Kit

The K-8689-B Meter Kit is used to meter all circuits of the 60 watt "BYR" models. The circuits of the K-8689-B is identical to the K-8689. The cable lengths differ from those of the K-8689 Meter Kit.

f. K-8689-C Meter Kit

The K-8689-C is designed to meter all the necessary circuits of the 30 watt "BYR" models. It is identical to the K-8689-B with the addition of the shunt resistor for 30 watt metering.

3. OPERATION

a. Single-Receiver "BY" and "BYR" Models

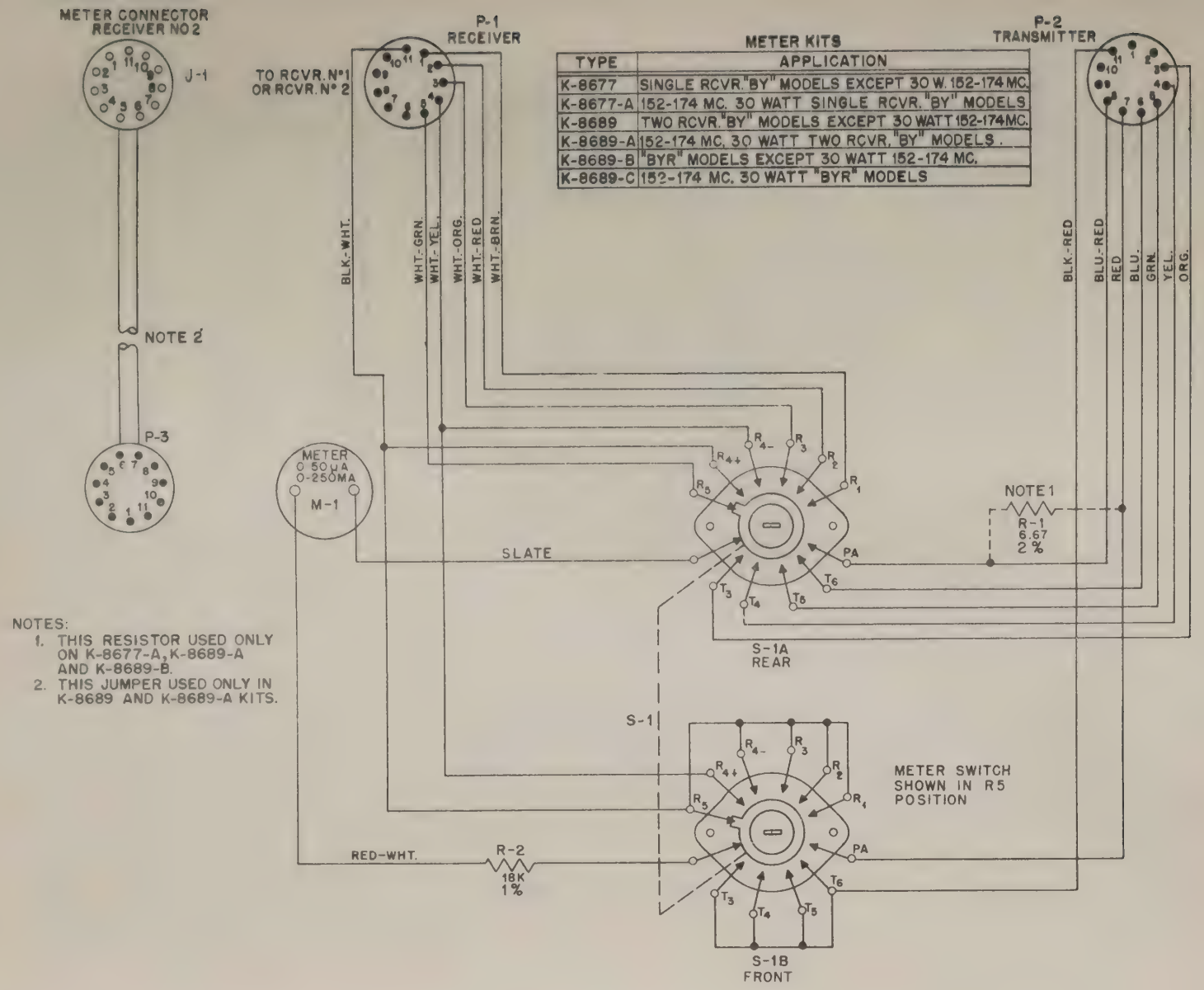
The circuit selector switch is mounted on the right hand side of the lower front panel. When using the built-in metering facilities the selector switch positions correspond to the Test Set selector switch positions given in the alignment instructions.

NOTE

The letter "R" preceeding the numerical switch designation on the selector switch designates "Receiver" metering positions. The letter "T" designates "Transmitter" Metering positions.

b. Two-Receiver "BY" Models

To meter the #1 receiver, the metering cable connector must be connected to the METERING connector on the #1 receiver. To meter the #2 receiver, the metering cable connector must be disconnected from the #1 receiver METERING connector and connected to the #2 receiver metering extension cable.



MOTOROLA
PART NO. 63C810683
ISSUE - O 10/54-CP

P-8677 & P-8689 SERIES METERING KITS
SCHEMATIC DIAGRAM

SCHEMATIC DIAGRAM PARTS LIST

Reference:
Schematic Diagram
63C810683

K-8677 and K-8677-A Metering Kits

REFERENCE SYMBOL	MOTOROLA PART No.	DESCRIPTION
		METER,
M 1	52B892096	Multiscale: 0-50 microampere and 0-250 milliampere scale
		CONNECTORS,
P 1	28A86870	Plug: male; 11 contact
P 2		Same as P 1
		RESISTORS,
R 1	17A892468	Fixed: wire wound; 6.67 ohm ±2%; 1/2 w; ins.; used on K-8677-A only
R 2	6A892470	Fixed: carbofilm; 18,000 ohm ±1%; 1/2 w; ins.
		SWITCH,
S 1	40B891279	Rotary: wafer; 2 section; 2 pole; 11 position; consisting of:
S 1A		2 pole; 11 position; rear; p/o S 1
S 1B		2 pole; 11 position; front; p/o S 1
		SHELL,
	15A483149	Connector: for reference part P 1, P 2

K-8689, K-8689-A, K-8689-B & K-8689-C Metering Kits

		METER,
M 1	52B892096	Multiscale: 0-50 microampere and 0-250 milliampere scale
		CONNECTOR,
J 1	9A893325	Plug: female; 11 contact; p/o W 1
		CONNECTORS,
P 1	28A86870	Plug: male; 11 contact
P 2		Same as P 1
P 3		Same as P 1 except p/o W 1
		RESISTORS,
R 1	17A892468	Fixed: wire-wound; 6.67 ohm ±2%; 1/2 w; ins.; used on K-8689-A and K-8689-C only
R 2	6A892470	Fixed: carbon; 18,000 ohm ±1%; 1/2 w; ins.
		SWITCH,
S 1	40B891279	Rotary: wafer; 2 section; 2 pole; 11 position; consisting of:
S 1A		2 pole; 11 position; rear; p/o S 1
S 1B		2 pole; 11 position; front; p/o S 1
		ASSEMBLY,
W 1	1X893001	Receiver metering extension cable and connectors; consisting of: miscellaneous wire 28A86870 Connector Cable; 11 contact; male 15A483149 Shield, connector 9A893325 Connector, Cable; 11 pin; female 15A475055 Shield, connector (used only on K-8689 and K-8689-A)

Motorola®

SERVICE BULLETIN #683
FOR
INSTRUCTION SECTION 54P812230-C

NATURE OF CHANGE:

Meter resistor tolerances reduced from 10% to 5% to provide more accurate meter readings. Two resistor values changed to reduce high meter readings.

SECTIONS AFFECTED:

Title	Part Number
30 W Transmitter	54P880395-L
60 W Transmitter	54P880456-H

CHASSIS & DIAGRAMS AFFECTED:

DESCRIPTION	CHASSIS NO.	CURRENT VERSION	DIAGRAM NUMBER	CURRENT ISSUE
1-Freq. 30 W Xmtr	PA-8461-B	-13	63E802357	-P
2-Freq. 30 W Xmtr	PA-8462-B	-13	63E802357	-P
3-Freq. 30 W Xmtr	PA-8463-B	-13	63E802357	-P
1-Freq. 30 W Xmtr	PA-8461-C	- 7	63E802357	-P
2-Freq. 30 W Xmtr	PA-8462-BC	-12	63E802357	-P
1-Freq. 30 W Xmtr	PA-8461-BP	-13	63E802344	-N
2-Freq. 30 W Xmtr	PA-8462-BP	-13	63E802344	-N
2-Freq. 30 W Xmtr	PA-8462-CP	- 7	63E802344	-N
1-Freq. 60 W Xmtr	PA-8491-B	-12	63E802352	-N
2-Freq. 60 W Xmtr	PA-8492-B	-12	63E802352	-N
3-Freq. 60 W Xmtr	PA-8493-B	-12	63E802352	-N
1-Freq. 60 W Xmtr	PA-8491-BC	- 1	63E802352	-N
1-Freq. 60 W Xmtr	PA-8491-BY	-12	63E802352	-N
1-Freq. 60 W Xmtr	PA-8491-BP	-12	63E802343	-M
1-Freq. 60 W Xmtr	PA-8492-BP	-12	63E802343	-M

CHANGE DETAILS:

SB AUTHOR. CHANGE	SYMBOL	ACTION	PART NUMBER	DESCRIPTION
683	R11	Change to	6R2050	RESISTOR, fixed; carbon; 270K ±5%; 1/2 w; ins.; p/o T1A
683	R12	Change to	6R5652	RESISTOR, fixed; carbon; 2.7K ±5%; 1/2 w; ins.; p/o T1A
683	R15	Change to	6R2061	RESISTOR, fixed: carbon; 180K ±5%; 1/2 w: ins.; p/o T2
683	R16	Change to	6R6166	RESISTOR, fixed: carbon; 1.2K ±5%; 1/2 w; ins.; p/o T2
683	R18	Change to	6R488186	RESISTOR, fixed: carbon; 2.7 meg. ±5%; 1/2 w; ins.;
683	R19	Change to	6R5786	RESISTOR, fixed: carbon; 27K ±5%; 1/2 w; ins.;

Motorola Communications and Electronics Division
4545 Augusta Blvd. Chicago 51, Illinois

SB #683
DATE 3/21/55

CHANGE DETAILS (Con't)

SB AUTHOR. CHANGE	SYMBOL	ACTION	PART NUMBER	DESCRIPTION
683	R20	Change to	6R5556	RESISTOR, fixed: carbon; 10K ±5%; 1/2 w; ins.; p/o K-8468 Parts List
683	R21	Change to	6R401017	RESISTOR, fixed: carbon; 1.8 meg. ±5%; ins.; p/o K-8468 Parts List

ATTACHMENTS:

None

MP MASTER
MA35730